AVIATION

The Oldest American Aeronautical Magazine

MAY 24, 1926 **Issued Weekly** **PRICE 15 CENTS**

The first N.A.T. Carrier Pigeon leaving Kansas City, Mo.

VOLUME XX

NUMBER 21

SPECIAL FEATURES

COMMANDER BYRD'S ARCTIC FLIGHT

THE FAIRCHILD CAMINEZ ENGINE

CIVIL AVIATION BILL PASSES

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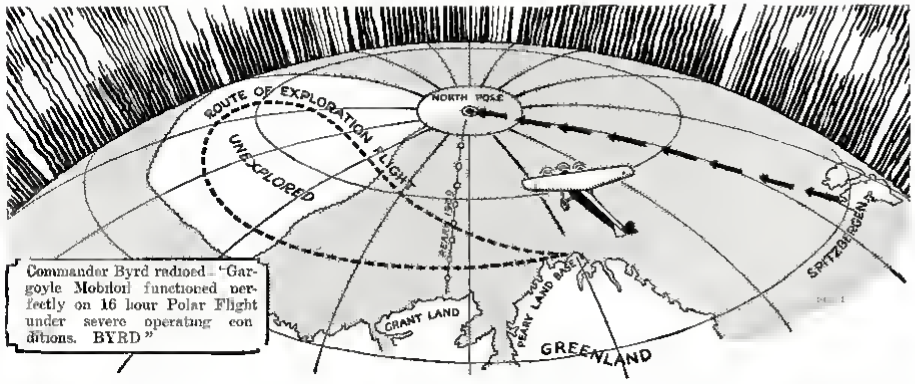

Commander Byrd radioed "Gargoyle Mobiloil functioned perfectly on 16 hour Polar Flight under severe operating conditions. BYRD"

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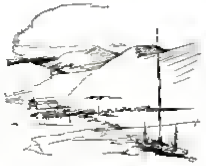

Kings Bay, Spitzbergen. Northernmost port open to navigation — a Norwegian possession. Byrd left *S. S. Chantier* here.

Lieut. Commander Byrd dressed for the Arctic.

Mobiloil-lubricated Fokker plane carries him safely to the North Pole

LIEUT. COMMANDER BYRD'S history-making flight marks another great achievement for flying, for a Naval aviator, and for a Mobiloil-lubricated plane.

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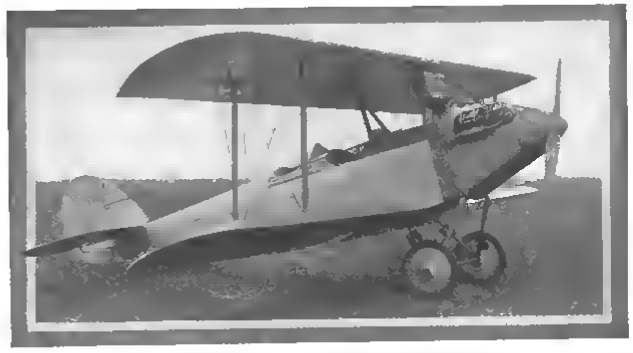

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No Pulitzer Races This Year

THE ANNOUNCEMENT that neither the Army nor the Navy will enter planes for the Pulitzer Trophy this year and that the Trophy will, therefore, not be contested for, does not come as a surprise. There has been a growing sentiment among the actual flying officers in both services that these races were not worth the cost, from a technical point of view and that, at best, racing was not a government function. The public, however, will feel disappointed that the race will not take place. There is no doubt that the Pulitzer Trophy has done an immense amount of good in times past. It has been an incentive to aerodynamic and structural development which raised the record speed of planes to extreme figures and set new standards.

The speeds of over five miles per minute, which have been achieved during the races have aroused an immense amount of public interest and focused the eyes of the nation on the national air meets.

Times have changed though and, for the moment, the great speed classic seems to have achieved its purpose. The design of pursuit planes has not yet caught up to the standards set by the speed planes, in fact, it is not impossible that the speed has been reached beyond which it is humanly possible to maneuver a plane and still retain consciousness. Also, the limit in streamlining and a possible minimum of frontal area for a given engine power, may have been more or less reached, so that no spectacular increases in speed can be hoped for until some radically new departure is adopted. The public also has become accustomed to the announcement of tremendous speed and, while they are still thrilled by the sight and sound of the pure speed plane, it no longer has the national interest formerly aroused.

The Pulitzer races have been a great drawing card for air shows but the backers of the National Air Races at the Philadelphia Sesqui-Centennial are organizing the meet with such vigor and energy that the events will, undoubtedly, draw large crowds. In fact, the public may even go away with a better impression of flying, than if they had witnessed aerial supermen ripping space asunder at a speed which may still be regarded by many as "unholy". Pure speed flying has a very great importance and, though temporarily abandoned, it will undoubtedly be resumed later, though possibly not under the rules of the Pulitzer Trophy with only the American Services competing.

Airplane Control and Safety in Flight

THERE ARE two schools of thought among those who believe that flying should be made safer if it is to become really popular. One school claims that a radical invention, such as the helicopter, the autogiro or the rotor plane, is necessary before absolute safety can be achieved, while the other school claims that continued development of the present general type of heavier-than-air machine will produce a plane which is sufficiently safe. So far, it appears that the latter school has rather the advantage. There has been a steady and constant progress toward the development of planes that can be controlled at and beyond the stalling point, the one great problem involved in the safety question, and which have a wide range of speed, though, in general, retain the accepted lines of a present-day airplane.

The problems to be solved in connection with the production of a fool proof plane are, fundamentally, comparatively simple, but, since these problems involve questions of a purely basic nature, progress is slow. The first basic problem in the safety question is that of speed range. In early airplanes, speed range was so small that, even when at maximum speed, these planes were usually flying close to the stalling point, with the result that a slight maneuver or a gust of wind would stall them. Through the gradual improvement in engines and in aerodynamic efficiency, modern planes have sufficient speed range and reserve power to render lack of these qualities no longer apparent.

The problem of delaying the stall condition in airfoils and avoiding the sudden precipitation of a stall is another question which has been, to a large extent, successfully met. The nearest approach to an ideal condition in this respect has apparently been reached in the Handley Page slotted wing.

All questions of control in airplanes, however, are entirely wrapped up in features of airfoils which directly concern the movement of the center pressure. In a modern efficient cambered wing, it is unfortunate that the movement of the center of pressure is unstable, any change in the attitude of the wing creating a new center of pressure position which further exaggerates, rather than otherwise, the tendency to change attitude. The design of an aerodynamically efficient wing with a fixed center of pressure, being impossible, therefore, other arrangements have been developed for providing this feature. The provision of the stabilizer or tailplane used in modern airplanes is one method, while swept back and washed out wings have been employed to this same end as have also normal wings with reflex trailing edges—a feature of a wing section which considerably stabilizes the center of pressure movement but greatly reduces its aerodynamic efficiency.

That the former method of obtaining longitudinal stability, and likewise control, has become more common, is no reason for believing, however, that other methods involving perhaps swept back wings could not be so developed as to prove as efficient if not better than present custom, especially when the successes of the Dunne type planes are recalled.

So it is, therefore, that recent experiments carried out in England with a completely tailless airplane will be followed by the entire aeronautical engineering field with the closest interest.

The Byrd Flight to the North Pole

Commander Byrd Gives Details of His Flight into the Polar Regions.

THE FLIGHT of Lieut. Comdr Richard E. Byrd, U.S.N. and Pilot Floyd Bennett to the North Pole and back has been reported far and wide throughout the entire world and it would seem futile to attempt to repeat the news here. The flight represents an achievement, from the standpoint of endurance, of the two participants and is an exceptional example of first class navigation. Secondly, without engines of the unsurpassed reliability of the Wright Whirlwind, three of which constituted the power plant of the Fokker plane in which the flight was made, the successful conclusion of the undertaking would have been impossible. And, from the standpoint of the airplane itself, it must not be forgotten that, while the flight itself was made in comparatively good weather, the climatic conditions were extreme and, furthermore, the ability to take-off from soft snow with a total weight of 10,000 lb., and on skis, is an achievement which, in itself, reflects considerable credit upon the design of plane used.

Lieut. Comdr. Richard E. Byrd

Due credit must be given to the *New York Times* for all the most reliable news and details of the flight and it is as a result of the publication in that daily paper of the story of the flight written by Commander Byrd himself that it is possible here to briefly outline the events which contributed to the undertaking.

Chantier Arrives in Arctic

The S. S. Chantier, which left New York on April 6, 1926, arrived at King's Bay, Spitzbergen, at 4:00 p.m. on April 29 to find the only available dock there occupied by the Norwegian gunboat Heimdal. As there seemed no possibility of the Heimdal's giving up its position to the Chantier, means had to be devised whereby the planes, the Fokker and the Curtiss Oriole, could be landed together with the necessary supplies, such that the flight to the Pole could be undertaken without undue delay since there was some fear that the good weather which had prevailed would not last out and the possibilities of a safe flight to the Pole would thereby be diminished.

The Chantier was anchored at a distance of about 300 yd. from the shore and, after working all night, by about 4:00 a.m. the next morning a large raft had been constructed and the Curtiss Oriole machine had been conveyed to the shore by its means. The next problem was to get the Fokker out of the forward hold of the Chantier. This was eventually accomplished and the fuselage was successfully secured to the raft. Wind, however, prevented further work that day and it was feared that, if the fuselage were taken ashore and the wing not removed until the next day, difficulty would be experienced in rigging the plane on shore as it would be necessary to rig a derrick to hoist the heavy Fokker wing for assembly. Accordingly, the work was suspended until the weather had subsided, it was found possible to bring the wing out and attach it to the fuselage which was already on the raft. By then, however, ice had collected around the Chantier and the raft and it needed the efforts of many of the crew to make a way through the broken ice with boat-hooks before the raft could be taken to the shore.

Trouble with Skis

On the third day, after having worked on the skis and engines all night, an attempt was made to taxi the plane up the hill from the shore but the skis proved weak and split. Work was carried on all the next night on the skis and the next day the first trial flight was attempted but the plane hesitated on its skis and then skidded around into a snow bank, smashing the right ski and bending one of the undercarriage members. Work was again undertaken over night to strengthen one of the smaller sets of skis which had been taken in reserve. It is not surprising that trouble was experienced with the skis since no previous experience was available on fitting such a large plane as the three-engine Fokker with an undercarriage of this type.

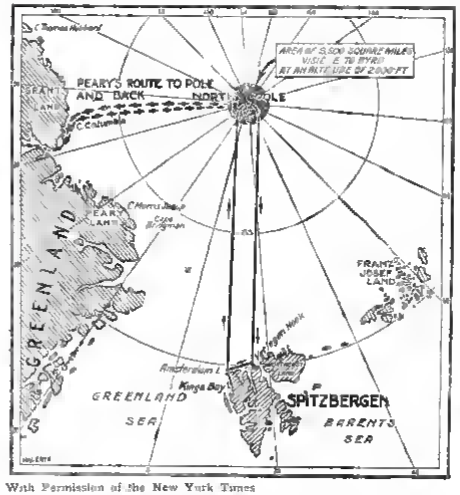
On the following day, after a runway was prepared some 1,000 ft. long through the snow and great care taken in removing as far as possible all unevenness in the ground, the second attempt was made at a trial flight light and the plane took off well, the buttons of the skis having been previously rubbed with resin tar. The flight lasted 2½ hr. with Floyd Bennett, chief pilot; G. O. Noville, flight engineer, and A. N. Parker, reserve pilot, each taking turns at the control. The engines had started perfectly in spite of the extremely cold weather experienced and ran without a single hitch.

Pilot Floyd Bennett

After more work had been done on the skis, it being believed by Byrd that even more strength was necessary before the machine could take-off fully loaded, everything was made in readiness for the flight Poleward. It was planned to fly direct to the Pole and to return via Cape Morris Jesup with a view to establishing a base there for further exploration flights. This was decided upon because it was feared that some difficulty might be experienced in landing at Cape Jesup upon an unprepared stretch of ice with a very full load on the machine.

A Bad Start

The plane was loaded for a 23 hr. flight and the total weight was 10,000 lb. Lieutenant Noville, who was to have accompanied Commander Byrd and Pilot Bennett on the flight, had to be left out at the last minute owing to the need for filling up the plane with more gasoline. The take-off was eventful for at every moment fear was felt for the strength of the skis to stand up to the great load. The plane taxied the entire length of the prepared runway and still showed no signs of gaining sufficient speed for flight, so the attempt had to be abandoned. The plane was taxied back up the hill and some equipment and fuel removed.



With Permission of the New York Times

A map of Commander Byrd's flight to the Pole and back from Spitzbergen

At 12:30 a.m. Greenwich Time on May 9, the second start was made. The tail of the plane was held by means of a line while the engines were raced, when the line was cut and the plane shot away down the slope toward the sea. The take-off was perfect and the machine headed out across the vast unknown toward the North Pole.

In addition to the navigation equipment and gasoline and oil carried for the actual flight, very considerable attention had been given to the possibility of a forced landing having to be made on the ice, in which case the fliers would have to make their way back to Spitzbergen on foot. This extra equipment carried in the plane, included: First, a short-wave radio with hand dynamo for sending in case the plane was forced down, second, a hand-made sled for man hauling supplies over the snow, third, two and a half months' food, consisting mainly of pemmican, chocolate, pilot bread, tea, malted milk, powdered chocolate, butter, sugar and cream cheese (this food had been carefully worked out to give the greatest possible number of calories); fourth, a rubber boat for getting across leads in the ice; fifth, extra fur clothes and shoes; sixth, a rifle and pistol and ammunition; seventh, a Primus gasoline stove, eighth, a light waterproof tent, ninth, hunting knives, ice knives and axes; tenth, a complete medical kit with surgical instruments, and eleventh, smoke bombs.

The course was set due North, Bennett piloting and Byrd spending every moment of his time navigating. Cape Mitre, twenty miles from King's Bay, was passed and then Amsterdam Island. Twenty six miles from Cape Mitre, Haakon Peninsula, a high peak reaching about 2000 ft. up, was passed and a few minutes later, Danes Island, where Audrée, thirty years ago had set out in a balloon to cross the polar cap and had never been heard of since. Shortly after this, the actual ice cap was reached and Commander Byrd gave the most careful attention to the navigating, knowing that, upon the accuracy of this alone, rested the success of the flight. He used the trap in the roof of the cabin just aft of the trailing edge of the wing through which to take observations with the sun compass and the floor trap for obtaining drift measurements. He found it possible for him to calculate the drift to within a degree. It was in taking observations through the upper trap that Commander Byrd got his nose and fingers frost bitten.

Gasoline Consumption

The weather throughout the flight was perfect and a height of about 2,000 ft. was maintained, where the temperature was found to be approximately 22 deg. below freezing Fahrenheit. After 3½ hr. flying, Commander Byrd took control for about fifteen minutes while Bennett proceeded to refill the gasoline tanks from the five gallon cans which were carried in the cabin of the plane. Byrd did not trust the magnetic compass to any degree and so held the sun compass in his left hand while he piloted. It was at this time that Bennett found that the three engines had consumed 32 gal. of gasoline per hour since leaving Spitzbergen (about 2 gal. more than was anticipated). However, the speed had been good—90 m.p.h.—and there were 480 gal. of gasoline left. A later check of the gasoline consumption showed this to have dropped to 30 gal. per hour.

Commander Byrd reported that the type of terrain over which the flight was being made was almost solid ice and no land was sighted. The ice at places was broken by a wide crevice over which, in places a thin sheet of ice had formed and left a roughened surface. Thus, while at first sight the ice would appear suitable for landing, it was in reality very weak in places and liable to fail under the weight of an airplane landing upon its surface.

The flight was continued, when, at a distance of about an hour's flight from the Pole, an oil leak was observed in the right engine. Considerable surprise was felt since the engine did not stop but kept up full revolutions in spite of the bad leak. The engine was throttled and it was found that a speed of 60 m.p.h. could be maintained with the remaining engines without loosing height, and it was, therefore, decided to continue to the Pole, which was reached at 9:04 a.m. Greenwich time.

The Return Flight

Thought was then turned toward coming back. The plane flew around the region of the Pole for a few minutes while Byrd and Bennett congratulated each other on their achievement. The leaking engine was still functioning perfectly and it was then discovered that it was not the engine which was leaking but the spare oil tank which had been fitted into the plane. Byrd set the course with the sun compass direct for Grey Hook, Spitzbergen, a few miles East of Amsterdam Island. Variations of the compass were found to be about 30 deg. which figure decreased as the distance from the Pole increased. The wind was now following the plane, it having changed, and the speed was about 100 m.p.h.

Considerable anxiety was felt for the accuracy of the navigation, which however, had been done with the greatest care and precision by Commander Byrd. It was realized that if any error was made there would be every likelihood of the plane missing Spitzbergen entirely and loosing its way out in the Arctic Ocean. The course was carefully set again and Byrd and Bennett exchanged duties between piloting and taking moving and still pictures, and the time lagged until, at about 2:30 p.m., Greenwich time, land was sighted ahead and the troubles with navigation were virtually at an end. The land was then approximately 100 miles ahead.

(Continued on Page 782)

Aviation in the Sesquicentennial Exposition

Aeronautics, Under the Direction of George F. Zimmer, to be a Feature of the Exposition in Philadelphia.

THE STORY of industrial expansion and scientific achievement over a stretch of one hundred and fifty years of American independence, which is the background for the Sesquicentennial Exposition, will be fittingly augmented by the part that Aviation will take in the celebration. The Committee has formulated plans which should make it one of the outstanding features of the Exposition.

The four fields available for flying activities have an aggregate area of more than five hundred acres, which can be greatly increased by the addition of adjacent lands, if necessary. The United States Navy Field, which immediately adjoins the Exposition grounds in the Navy Yard, will care for the Army, Navy and Marine aircraft. The Municipal Field, completely equipped with hangars, machine shops and lighting facilities for night flying, is located four miles from the Exposition grounds, and will provide accommodations for visiting civilian planes and National

George F. Zimmer
Director of Aviation Sesqui Centennial Phila

Guard flying units, as well as a stage for aviation meets, air races and contests. Pitcairn Field, situated fifteen miles from the grounds, with its complete equipment, will be able to provide parking space and accommodations for visiting civilian planes and National Guard units and also permit the holding of the larger flying events, aerial races and meets. Adjoining League Island Park and located within the Exposition grounds, the Sesquicentennial Field will afford a landing place for planes carrying people from other cities to the Exposition. Passenger carrying planes, which will take people for sight-seeing flights, will be located at this Field and exhibition and demonstration flights will also be held at this point. In addition to the fields mentioned, numerous others in the vicinity of Philadelphia will be used to accommodate visiting planes.

During the Exposition, the United States Navy Yard will be open to the public. This embraces the Naval Aircraft Factory, one of the largest aircraft manufacturing facilities of its kind in the world, and will offer the visitor the opportunity of witnessing the actual making of airplanes, different types of Army and Navy planes in use, the activities of seaplanes, flying boats and amphibians on the river and the launching of airplanes from catapaults.

On a far larger scale than ever before attempted, will be the National Air Races of 1926, to be held from Sept. 4 to 11 in Philadelphia in connection with the Exposition. Howard F. Wehrle, who is in charge of this part of the program, announces that more events and higher prize money awards for contestants than ever before in this meet will feature the Races.

Commencing Oct. 11 and continuing for a week, the National convention of the American Legion will be held, when special aviation activities will be conducted, wherein many of the World War fliers will participate. Negotiations are under way to bring to the Exposition the Commercial Reliability Tour for the Edsell Ford Trophy and arrangements are being made with the Militia Bureau of the War Department for a special participation in the air program by the National Guard Flying Units from different states.

Twelve thousand feet of the floor space in the Transportation Building of the Exposition will be devoted to still exhibits of aviation. This space is located in the center of the building and will be given over exclusively to aeronautics. Individuals and companies may obtain further information regarding floor space in this exhibition by addressing the Committee.

The history of aviation will be given in a motion picture, which will chronicle the story from the first experiments of the Wright brothers to present-day developments. The part played by aviation in the World War, government tests and experiments, commercial activities, passenger carrying, transportation, cotton dusting, aerial photographing, mapping and the air mail will also be featured on the screen.

Sanctioned and backed by the foremost men in aviation, with plans that promise aeronautical exhibits of our own and those of foreign countries, such as have never before been gathered together, this event should have the support of every unit of the aircraft industry and the cooperation of all organizations interested in furthering the cause of aviation. The Aeronautical Chamber of Commerce has sanctioned aircraft exhibitions and the display of models of airplanes, airships and balloons by suspending them from the ceiling throughout the transportation building, without charge, will be permitted. Exhibitors may attach appropriate signs bearing the name of the maker and short descriptive matter to models sent.

The entire aviation section of the Exposition is under the direction of George F. Zimmer, as Director of Aviation, and undoubtedly this section will prove one of the most interesting and most popular of the activities.

The Byrd Flight to the North Pole

Continued from page 781

Commander Byrd brings his story of the flight to close with a description of their pleasure at being again over King's Bay and the reception they received on alighting on the runway from which, about fifteen hours previously, they had set out to reach the Pole.

Undoubtedly, one of the greatest features of the entire flight, apart from the skill and endurance exhibited by Commander Byrd and Pilot Bennett, is the extreme reliability of the Wright Whirlwind engines which ran without a hitch and without giving the fliers a moment of anxiety during the entire flight to the Pole and during the other test and trial flights which were undertaken in the Arctic regions from King's Bay. The extreme cold provided new tests for these engines and that they passed the tests with perfect reliability is not surprising for the Whirlwind engine but it is extremely gratifying to all. The work of T. H. Kincaid, engine expert, sent to the expedition by the Wright Aeronautical Corp., manufacturers of the engines, must be remembered as having contributed in no small measure to the success of the flight.

Chicago–Dallas Air Mail Opened

National Air Transport, Inc., Inaugurates Air Mail Service Over Central Route.

WITH A LITTLE group of National Air Transport, Inc., and Post Office officials and workers silently looking on, the first mail and express plane of the Chicago-Dallas line swept down the runway at the Maywood flying field at 6.05 a.m., May 12, and took off toward the Southwest.

Thus began the actual carrying out of one of the greatest tests of the practical possibilities latent in commercial aviation yet made by private enterprise. The day was ideal for the start of the Chicago-Dallas flight. The sky was cloudless and a fresh tail wind was blowing. Throughout the day, weather conditions remained perfect along the entire route. So, in spite of the newness of the undertaking and the naturally congested state at the stopping points, both the North and the South flights were made in better than schedule time. While exact records will not be compiled for several days, about 1,200 lb. of mail were handled at the Chicago terminal of the line alone and several hundred pounds in addition were certainly handled at the other seven stopping places.

Extra Mail Planes Needed

So much mail was sent to the Southwest from New York and the East that the Post Office put two planes on the night flight to Chicago. Part of the mail which they brought and which had accumulated locally was put on a Carrier Pigeon in charge of Pilot Paul E. Johnson, which left at 6:05 a.m. Fifty minutes later, Edmund Matuchu took off in a second Pigeon with the rest. The relay plane to which the cargoes of both were transferred at Kansas City got to Dallas at 5:30 p.m., making the flight from Chicago in 11 hr. 25 min., instead of 11 hr. 50 min., as called for in regular schedule.

Meanwhile, at 8:15 a.m., two planes took off from Love Field, Dallas. Two other airplanes relieved them at Kansas City and reached Chicago at 8 p.m. and 8:35 p.m. Hence, in spite of a slight headwind, and the newness of operations, the flight North was made in 11 hr. 45 min.,—five minutes less than the time allotted to the schedule.

Carl F. Egge, superintendent of mail for the Eastern Division in the Post Office Air Mail service, arrived in Chicago from his office in Cleveland, O., in time to take charge at Maywood during the first day of N.A.T. operation. In view of the large amount of mail directed to New York and points East which he learned the Pigeons were carrying, he sent off the overnight flier at its usual time and assigned Pilot S. J. Short and a Boeing plane with a capacity of 1,000 lb. to carry only the letters and packages from the South.

Both National Air Transport officials and Post Office officials and workers expressed themselves as well satisfied with the results of the first day. Col. Paul Henderson, general manager of the N.A.T., Luther K. Bell, general traffic manager, and L. D. Seymour, chief engineer, spent the day attending christenings and in watching operations along the line between Chicago and Kansas City. They agreed that the start was auspicious.

The christening of the airplane "Chicago" on the afternoon of May 8 was made the occasion for the opening of Chicago's new municipal air port. For two years, the Aero Commission, under Maj. P. G. Kemp, had been preparing this field, a mile long and half a mile wide, for flying purposes. The last of the farmers will be off the property this fall. For days before the christening, workmen were busy draining the land and forming a 2,600 ft. V-shaped runway, 100 ft. wide, with cinders furnished by George F. Foster, of the Commonwealth Edison Company and chairman of the Aviation Committee of the Association of Commerce. A 25 ft. path was also made, connecting the legs of the Vee and parallel with Cicero Avenue, North of 63rd Street. East of this path, hangar and shop space will be rented to aviators and air transport concerns. The city has made an appropriation of $225,000 for fully developing this plot and it will undoubtedly be a credit in time. As it is a dozen miles from the post office, a landing field for taking on and delivering mail and, eventually passengers, will undoubtedly be formed on the lake front near the Loop district within the next year or two. Maywood Field, which the Post Office now uses, is even further West than the Municipal field.

Christening of Planes

Long before the time for the christening, visiting airplanes began arriving, until 12 or 15 were lined up. The N.A.T. Curtiss Carrier Pigeon came at 2:30 p.m. and was pulled up the 25 ft. path to a platform under a tent which was to be used as a center of attention. A preliminary ceremony was the photographing of half a dozen officials and members of the Rotary Club of Chicago. The group included John J. Mitchell, Jr., treasurer of the N.A.T. This club, interested in the N.A.T. by Mr. Mitchell, sent letters to Rotary Clubs in 42 cities along the route on the first mail trip and received responses from them. They have a membership of 4,500. It also sent copies of the photograph to the Rotary Clubs of the cities which are stopping points for the N.A.T.

An N.A.T. Carrier Pigeon (Liberty engine) leaving Chicago for Moline and other points South with mail

and will receive photographs of officials taken beside Carrier Pigeons on the flying fields down the line

Major Kemp presided at the brief speaking exercises which came before the christening. About 5,000 people were roaming about the field and few could get near enough to hear, but the sight of the planes, some of which were constantly flitting about overhead, kept everyone interested from the small boys to the dignified business men and city officials. Talks were made by R. W. Dawes, cousin of the Vice President of the United States and president of the Association of Commerce, Aldermun Dorsey Crowe, chairman of the City Council Committee on City Planning, Postmaster Arthur C. Lueder, and John J. Mitchell, Jr., treasurer of the N.A.T. After the talks, Mr. Mitchell escorted Miss Marguerite Foster, 15 year-old daughter of George F. Foster, to the airplane, where she smashed a bottle of ginger ale on the hub of the running gear under the direction of Pilot Mutucha, while camera men and movie operators "shot" her from every side. After cracking the bottle, which had been placed in a cheesecloth bag as a matter of precaution, against the wheel till the most nervous camera man was satisfied that he had a good picture, Miss Foster turned to a cage of 4 homing, or carrier pigeons which had been sent on for the celebration from the Naval Air Station at Anacostia, D.C., and slowly released them. The birds carried with them to Washington messages from Mayor Dever to the Secretary of War, from Mr. Dawes to the Secretary of Commerce and from Postmaster Lueder to the Postmaster General. As the opening of the Municipal Air Port for the christening occurred 2 months ahead of the time planned for the dedication of the field, it attracted a great amount of attention from the press and the people and helped to secure the 11,000 letters which, it is estimated, the first planes carried down the line from Chicago and the East on the initial mail flight.

Preliminary Preparations

The mail and express planes of the National Air Transport, Inc., have been operating between Chicago and Dallas on regular schedule time since May 6. For six days before the Line began to carry mails, all the employees were given the opportunity of learning their duties. More important than all else, the pilots became accustomed to following the trail and keeping their flights in time with the announced program. Preliminary flights made over the Line indicated that the pilots would be able to live up to the schedule, which requires them to keep the run from Chicago to Dallas at 11 hr. and 50 min.

To provide for difficulties, the machines and the latter portions of the route are equipped with lights. In addition, the machines are all provided with new inertia self-starters. These work something after the fashion of the weighted fly wheels used to propel mechanical toys. The pilot winds up a mechanism which causes a heavy weight to revolve. The momentum and inertia of the moving weight is great enough to start the propeller—a task which takes the power of two men when done by hand. With the self-starter available, a pilot can readily take off by himself after a forced landing. The Carrier Pigeons carry, in addition to the usual red and green lights on the wings and white lights on the tail, two search lights on the wings for use in alighting after dark. For emergency purposes, also, each plane carries two parachute flares which the pilot may release in case he is compelled to come down in unknown country. These burn for three minutes and light up 3½ sq. miles. They are ignited automatically as they leave their containers.

Route Markings

The Standard Oil Company of Indiana and the Magnolia Petroleum Company of Texas have contributed their share toward the safety of the N.A.T. mail planes by marking their bulk station warehouses with the names of the towns in which they are located. The lettering is 12 ft. high and 1 ft. broad and is painted on the roofs of the structures so that the pilots above can readily read the signs. At the North end of the building, the initials of the companies indicate the direction, while arrows with 5 ft. shafts, point to landing fields where such exist. (This work is similar to the extensive roof marking carried out by the Standard Oil Co. along the West coast.) About 75 of these dot the N.A.T. route from Chicago to the Kansas City-Oklahoma line, where the Standard Oil yields to the Magnolia Petroleum, and about 25 signs carry on the plan to Dallas. The markings will undoubtedly be of great service in preventing the pilots from going astray. Between 350 and 400 towns in the general vicinity of N.A.T. route have been marked by various agencies. Probably the number in Indiana, Nebraska, Texas, Oklahoma, Illinois, New Mexico and Arkansas will reach more than 2,000 within the next few months.

(c) R. S. Knowlson

An N.A.T. Carrier Pigeon (Liberty engine) about to leave Richards Field, Kansas City, with mail

Route to be Lighted

When the law permits, it is expected that the entire N.A.T. route will be lighted for night flying by the government. Anticipating emergencies, the National Air Transport has arranged for lighting at either end of its line, to provide for the safety of planes in case of delay. At the northern end, the N.A.T. route is the same as the illuminated transcontinental Post Office air mail route from Chicago, 120 miles to Cordova, 30 miles Northeast of Moline. The N.A.T. has added 80 miles of illuminated airway bringing the total up to 200 miles. The lighting begins again at Oklahoma City, 210 miles from the southern terminal of the route.

The Fields on the Route

Seven of the eight fields on which the N.A.T. planes will alight have been provided by the Chambers of Commerce along the way. What will be done in Chicago eventually in the way of providing the N.A.T. with quarters is not yet fully determined. Meanwhile, it is using Checkerboard Field, across the street from the field used by the Post Office air mail planes at Maywood. This field has two runways 1,500 ft. long by 200 ft. broad. Here, the N.A.T. has a hangar and will keep two pilots, two mechanics, a helper and a field manager. There is a well equipped shop and spare parts for the ships. There is no lighting, as the lighting on Maywood Field can be utilized. The N.A.T. planes may alight on Maywood Field to leave or take aboard mail pouches.

Southwest of Checkerboard Field, 143 miles as the plane flies, is Moline and nearby are Rock Island and Davenport. Franning Field, at Moline, has been placed at the N.A.T.'s disposal and serves the Tri-Cities. It is 2,600 ft. long and 1,800 ft. wide and is illuminated with a 20 in. revolving beacon, boundary lights and flood lights to reveal the hangar and other obstructions. From Cordova to Winfield, Ia., about 50 miles beyond Moline, the route is illuminated with acetylene routing beacons. The field manager, clerk and mechanic and his helper constitute the force of this field.

The next jump is 251 miles to St. Joseph, where the municipality has placed Rosenerans Field, half a mile square, and a hangar at the service of the N.A.T. There will be a large force of mechanics here with spare parts and extra engines and special tools for taking care of all engine difficulties. This field is not lighted, nor is the next field, Richards Field, provided by the Kansas City Chamber of Commerce, 66 miles away. This field is about half a mile square. As it is the center of operations, with facilities for dispatching the planes all along the route, for storing 4 or 5 planes and for inspecting and repairing planes, about 15 men will be stationed at this field when the line is in full working order. Four pilots will be at this field and two at each of the terminals. As machines are dispatched, the moves are followed on a board and telegrams from the fields apprise the manager of operations of the position of all the planes out, as they move, or stop.

Southern End of Route Lighted

Travel Air Field, at Wichita, 168 miles further along the route, is about half a mile long by a trifle more than a quarter wide. The field manager, mechanic and helper will take care of the difficulties here. There are no lights. The municipal field at Oklahoma City, 158 miles further, has a 2,000 ft. runway and a hangar. Here the lighting system begins again and the field has a 20 in. revolving beacon, boundary and flood lights. Every two miles for the rest of the route, routing beacons are placed. This field has a manager, a mechanic and helper. The next field, 185 miles further, at Fort Worth, is manned merely by a clerk, owing to the proximity of the terminal at Dallas. This is also a muncipal field, 2,500 ft. long and 2,000 ft. wide. It is lighted with a 24 in. beacon, flood and boundary lights.

Love Field, Dallas, is half a mile square and has much the same equipment and force as Checkerboard Field. It is lighted with a 24 in. beacon and flood and boundary lights.

Airplanes in the Stirling Expedition

An airplane, backed by an army of nearly 400 men, is now launched on the most determined attempt yet made to explore the World's last great "unknown land" and its pygmy inhabitants. The airplane and the army compose the American-Dutch New Guinea expedition under the auspices of the Smithsonian Institution, which Dr. Matthew W. Stirling is leading. According to word just received at the Smithsonian from Dr. Stirling, the expedition has started up the Memberamo River, New Guinea, headed for the Snowy Mountains.

The Memberamo River, by which the expedition is entering the unknown land, has its mouth on the North coast of Cape d'Urville. The expedition is working South up the river to the junction of the Rouffar, by which it hopes to gain access to the mountains. It is establishing various supply bases, from one of which the Yackey Transport plane, which Dr. Stirling took with him from this country, will operate.

The Yackey transport is to serve primarily as the eye of the expedition.

It will reconnoitre the river split jungle to determine the best approach to the mountains, it will attempt to find the hidden villages of the pygmy peoples known to dwell in the mountains, it will carry cartographers to make maps of this virgin land; and, if posible, it will make landings in isolated spots for natural history collections.

When it left San Francisco last fall, the expedition comprised one Yackey transport plane and five men: Dr. Stirling, leader and anthropologist, R. K. Peck, photographer; Hans H. Hoyte, chief pilot, A. E. Hamer, assistant photographer and mechanic; and S. A. Hedberg, historian of the expedition. Today, it comprises a total personnel of between 300 and 400 persons and has the official cooperation of the Dutch East Indian Government, whose ships transport the expedition and will maintain its communications with civilization.

Civil Aviation Bill Passes

Bill Passes Through Conference and is Ready for President's Signature

IN DECEMBER, the Senate passed the Bingham Bill regulating civil aeronautics. This Bill was published in AVIATION, Dec 28, 1925 In March, the House passed the Merrit-Parker Bill, which was published in AVIATION, March 22 The two bills went into a conference of the Senate and House and the compromise bill is now ready for the signature of President Coolidge The bill will undoubtedly be signed and will then be published in full

The following statement of the house managers of the bill indicates the differences in the two bills and the compromises which were reached in regard to essential matters. The statement will be used as an interpretation of the intention of Congress with regard to the final bill It will take a long time to work out the detail regulations of the law and its provisions will probably not be enforced for six or eight months from the date of signature

The House Statement

The managers on the part of the House at the conference on the disagreeing votes of the two Houses on the amendments of the Senate to the bill (S 41) to encourage and regulate the use of aircraft in commerce, and for other purposes, submit the following statement in explanation of the effect of the action agreed upon by the conferees and recommended in the accompanying conference report

The House amendment struck out all of the Senate bill after the enacting clause The Senate receded from its disagreement to the amendment of the House with an amendment which is a substitute for both the Senate bill and the House amendment

The essential differences between the Senate bill and the House amendment may be enumerated as follows

Registration of Planes

"1 Registration The Senate bill restricted compulsory registration to aircraft engaging in interstate and foreign commerce, whether or not in the navigable air space The House amendment covered all air navigation in the navigable air space, whether in interstate or intrastate commerce, and whether commercial or noncommercial. The substitute requires the registration of aircraft engaged in the following classes of commercial air navigation

"(a) The transportation in interstate or foreign commerce of persons or property for hire, either in whole or in part by aircraft, whether or not the air portion of the transportation is interstate or foreign or is intrastate. The transportation of property for hire includes the transportation of the mails by aircraft

"(b) The interstate and foreign navigation of aircraft in furtherance of a business, as, for instance, the transportation of factory products from the main plant to a branch office, or the use of aircraft by salesmen or insurance agents or professional men while traveling upon business The clause of course would not cover the use of aircraft for the purpose of transportation from home to office The clause would have no unreasonably restrictive application to flights for scientific or experimental purposes in furtherance of a business, for the reason that such flights would not ordinarily be interstate or foreign, but would be conducted wholly within the limits of one State.

"(c) The interstate or foreign navigation of aircraft from one place to another in the operation or conduct of a business This clause would cover the gypsy flier and the exhibitor at county fairs if he navigated his aircraft from a place of exhibition in one State to a place of exhibition in another State, or from a place in one State where he conducts intrastate transportation for hire to a place in another State where he conducts intrastate transportation for hire

"Under both the Senate bill and the House amendment aircraft were eligible for registration only if owned by citizens of the United States Under the Senate bill a corporation was deemed to be a citizen if two-thirds of the stock, whether voting or nonvoting, was owned by United States citizens The House amendment provided for such registration in case of a corporation if 51 per cent of the voting stock is controlled by citizens of the United States The substitute requires 51 per cent of the voting stock to be controlled by citizens of the United States

"Under both the Senate bill and House amendment aircraft eligible for registration could obtain registration even though not required to do so by the penalty provisions The substitute retains this provision, together with the requirement that any aircraft obtaining registration, whether or not required to register, must conform to the regulations as to airworthiness and as to the certification of its airmen

Inspection

"2 Rating of aircraft The Senate bill provides for the inspection of each aircraft before it is used in interstate or foreign commerce and the certification of its condition, capacity, and safety at the date of inspection Further, from time to time thereafter the Secretary of Commerce is authorized to inspect and test the aircraft as to its airworthiness. The House amendment authorized the Secretary of Commerce to provide for the examination and rating upon registration and periodically thereafter of registered aircraft as to their airworthiness The House amendment would not require the examination to be made by officers of the Government. The substitute requires the Secretary to provide for the examination and rating of registered aircraft as to their airworthiness It further provides specifically that the Secretary may require periodic examinations to be made of aircraft in service and reports thereon either by officers or employes of the Department of Commerce or by properly qualified private persons In addition, the Secretary may, in his discretion, accept as a basis for rating the reports of properly qualified persons employed by manufacturers or owners of aircraft, and after the first eight months after the passage of the act may deny registration to any aircraft applying therefore unless full particulars of the design and the calculations upon which the design is based and the materials and methods used in the construction are furnished him The Secretary may, from time to time, rerate aircraft upon the basis of the above information

"3 Rating of airmen The Senate bill authorized the Secretary of Commerce to examine and determine the qualifications of individuals to serve as airmen upon or in connection with any aircraft in the United States The House amendment provided for the periodic examination of any airman serving upon or in connection with registered aircraft. The substitute adopts the provision of the House amendment

"4 Rating of air navigation facilities The House amendment provided for the periodic examination and rating of air navigation facilities The Senate bill contained no such provision The substitute adopts the House provision except that such examination and rating need not be periodic

Traffic Regulations

"5 Air traffic rules The substitute provides that the Secretary shall by regulation establish air traffic rules for the navigation, protection, and identification of all aircraft, including rules as to safe altitudes of flight and rules for the prevention of collisions between vessels and aircraft The provision as to rules for taking off and alighting, for instance, was eliminated as unnecessary specification, for the reason that such rules are but one class of air traffic rules for the navigation and protection of aircraft. Rules as to marking were eliminated for the reason that such rules were fairly included within the scope of air traffic rules for the identification of aircraft. No attempt is made by either the Senate bill or the House amendment to fully define the various classes of rules that would fall within the scope of air traffic rules, as, for instance, lights and signals along airways and at air ports and upon emergency landing fields In general, these rules would relate to the same subjects as those covered by navigation laws and regulations and by the various State motor vehicle traffic codes As noted above, surplusage was eliminated in specifying particular air traffic rules in order that the term might be given the broadest possible construction by the Department of Commerce and the courts

"In order to protect and prevent undue burdens upon interstate and foreign air commerce the air traffic rules are to apply whether the aircraft is engaged in commercial or noncommercial, or in foreign, interstate, or intrastate navigation in the United States, and whether or not the aircraft is registered or is navigating in a civil airway

"6 Public aircraft Under the substitute public aircraft of the Federal Government are exempt from the airworthiness requirements and the regulations as to the rating of airmen unless such aircraft are voluntarily registered, but public aircraft of the Federal Government are not exempt from the air traffic rules except in so far as the Secretary of War has control over exclusively military aircraft upon military airways

No Foreign Planes in Commerce

"7 Foreign aircraft Under the substitute foreign aircraft can not engage in interstate or intrastate commerce, but can engage in all other air navigation, foreign, interstate, or intrastate, if permitted by the Secretary of Commerce and if the foreign nation grants a similar exemption While engaged in such other air navigation foreign aircraft may, to such extent as the Secretary deems advisable, be exempt from the requirements as to airworthiness and rating of airmen, but not from the air traffic rules

Airports and Airways

"8 Aids to air navigation The Senate bill provided for (a) the establishment and operation by the Secretary of Commerce within the limits of appropriations made by Congress, of aerial lights, lighthouses, and signal stations, radio directional finding facilities, and radio communication facilities, whether along air routes or at air ports or emergency landing fields or elsewhere, (b) the charting of commercial air routes and the publication of maps of such routes, (c) the making available to the public the use of the air ports, aerial lights and lighthouses, and signal stations, radio directional finding facilities, and radio communication facilities of any Government department, under such conditions and to such extent as the head of the department deemed advisable and by regulation prescribed, (d) the sale in emergencies at Government air ports of fuel, oil, equipment, and the furnishing in emergencies of supplies and other assistance at the local fair market value, (e) the furnishing exclusively by the Weather Bureau of meteorological information to promote the safety and efficiency of air navigation, particularly along civil airways. The House amendment retained all of the above features except that air navigation facilities could be established along airways only, i e., at air ports, emergency landing fields, and intermediate points. The House amendment provided also for the establishing and operation along airways of air ports, emergency landing fields, and electrical communication facilities, and for the transfer to the Secretary of Commerce by joint action of the Postmaster General and the Secretary of Commerce of the air ports, emergency landing fields, and other air navigation facilities of the air mail service. The substitute retains the features of both the Senate bill and the House amendment, except that the Secretary of Commerce may not establish or operate air ports and that the transfer of the air mail service air ports may be made only to municipalities, and then only under arrangements subject to the approval of the President The air ports of the air mail service are referred to in section 5 (a) as air ports or terminal landing fields

"9 Penalties The Senate bill provided for the enforcement of the provisions of the act and regulations thereunder through a system of flat civil penalties and liens subject to administrative mitigation and remission, similar to the penalties by which the customs and navigation laws are enforced. The House amendment provided for enforcement through Federal criminal penalties and also authorized the several States to provide for the prosecution of the Federal offenses occurring within their respective jurisdiction and to prescribe penalties or forfeitures, civil or criminal, to be imposed for such offenses. Trial and acquittal or conviction of any person under such State law was to constitute a bar to his trial and conviction by the Federal Government for the offense The substitute retains the Senate provision but with such additional administrative machinery as will make the provision effective It also provides the constitutional basis necessary for enforcement of liens and penalties against aircraft by simulated admiralty proceedings

Scientific Body Unchanged

"10 Advisory Committee for Aeronautics The House bill provided for increasing the membership of the Advisory Committee for Aeronautics by additional members, one each from the office of the Assistant Secretary of Commerce in charge of civil air navigation, the office of the Postmaster General in charge of the air mail service, and the Coast Guard The Senate bill contained no such provision and the substitute omits it.

"11 Navigable airspace. The House bill provides a public right of freedom of interstate and foreign air navigation in the navigable airspace similar to the public right of such navigation upon navigable waters Such navigable airspace comprises the airspace above the minimum safe altitudes of flight prescribed by the Secretary of Commerce These altitudes would vary with the terrene and location of cities and would coincide with the surface of the land or water at airports The power to fix the various altitudes was, therefore, left to the discretion of the Secretary of Commerce, having regard to the above-mentioned and other relevant factors The Senate bill contained no such section, but the provisions of the House amendment are retained by the substitute.

Air Secretary in Washington

"12 Assistant Secretary of Commerce The Senate bill provided for an Assistant Secretary of Commerce to be appointed by the President and the Senate and to receive a salary of $7,500 a year The House amendment retained this provision, making it clear that the new office of the Assistant Secretary is in addition to that now provided by law, and that the functions of the new Assistant Secretary are confined to civil air navigation, but providing for the fixing of his compensation in accordance with the classification act of 1923 The substitute retains substantially the House provision.

"13 Airspace reservation The House amendment provided for the establishment and protection of air-space reservations for national defense and other governmental purposes, and in addition in the District of Columbia for public-safety purposes No similar provision was included in the Senate bill The substitute retains the House provision, and all air navigation within any air space reservation is subject to the restrictions imposed by the Executive order relating to such reservations.

"14 Issuance, suspension, and revocation of certificates Both the Senate bill and the House amendment provided for the issuance, suspension, and revocation of certificates in enforcing the act In the Senate bill the procedure was left to regulation by the Secretary of Commerce The House amendment, for the more adequate protection of the individual, provided for proper notice and hearing and opportunity for review, by extraordinary remedy, of the decision of the Secretary upon questions of law, as, for example, the unconstitutionality of the substantive law applied or the procedure used, failure to observe the procedure required by law the proper application of the statute or any regulation having the force of law and the existence of at least some evidence to support the finding of fact The substitute retains the provisions of the House amendment"

JAMES S PARKER,
JOHN G COOPER,
SCHUYLER MERRITT,
SAM RAYBURN,
CLARENCE F LEA,
Managers on the part of the House

The Fairchild–Caminez Engine

An Airplane Engine Designed Along New Lines and Embodying Entirely New Principles Successfully Tested in Flight.

EXTREMELY INTERESTING tests were recently carried ont at the Fairchild flying field, Farmingdale, Long Island, on the new Fairchild-Caminez engine, designed and built by the Fairchild-Caminez Engine Corp, of New York. The engine, which is a four-cylinder air-cooled radial, was fitted into an Avro 504K type machine and the demonstrations, under the guidance of Capt. Richard H. Depew, Jr., were highly successful.

The engine was originally designed and constructed at the Engineering Division at McCook Field, under the direction of Harold Caminez, who was then in charge of the engine design Section, but who is now a member of the Fairchild Company. The engine develops 150 hp., is air-cooled, and a cam and roller arrangement is used in place of the conventional crank shaft and connecting rods. It is a four cylinder "X" type with a projected frontal area of 3.9 sq. ft., and, although of very sturdy construction and designed for a service life of over 500 hr., its weight is less than 360 lb.

There is a big demand for light, efficient aircraft engines in America at this time, and it is planned to place this new engine in production within the next few weeks. It will sell for less than a medium-priced automobile, and will require little care in maintenance.

The Conception of the Idea

The inventor, Harold Caminez, first started work on the Cam engine seven years ago, at Cornell, while studying mechanisms. It had appeared to him that the elimination of timing gears would be a considerable improvement. So he proceeded to produce a mechanism which would give four strokes per revolutions to coincide with the four-stroke cycle that is employed in internal combustion engines.

After his first year at McCook Field, in his spare time, Mr. Caminez worked up the Cam mechanism in an aircraft engine design, submitting the design to Major Hallett, at that time Chief of Power Plant Section. Major Hallett studied the design, making some very valuable suggestions. It was decided that, before any engine of this radical nature should be built, it was better to do some experimental work, and, therefore, Mr. Caminez constructed (in his Y.M.C.A. shops) a model engine using the Cam mechanism. This engine was tested in the laboratory at McCook Field on compressed air and ran very well considering the more or less amateur nature of the machine work.

There were a lot of faults in this first design, and, from data obtained in building the experimental model, Mr. Caminez made a new, practical design of Cam engine for airplane work. This design was taken up with the Chief Engineer at McCook Field and with the Chief of Power Plant Section and it was decided to make a test engine. This first engine at McCook Field was somewhat crude but it showed that there were very good chances that a satisfactory Cam engine could be made if development were continued.

Later, Sherman M. Fairchild, president of the Fairchild Aviation Corp., became interested in the engine and the Fairchild-Caminez Engine Corp., Division of the Fairchild Aviation Corp., is now engaged in the manufacture of the type of power plant. The first engine, the model 447-B, rated at 150 hp., constructed by this company was given its first ground test in May, 1925. It has been on ground test for the past eleven months and on air test for the past few weeks and no defects in the basic design of the engine have been revealed.

Other Engines to Come

The Fairchild-Caminez company is now concentrating its efforts on the production of a 150 hp. air-cooled engine which will develop its rated power at 1200 r.p.m. The company's factory at Farmingdale, Long Island, has been equipped for the manufacture of these engines and for the development of a complete line of various size engines of similar construction. Preparations for the production of 150 hp. engines are now under way and the designs of engines of 80 hp., 300 hp. and 600 hp., are also in progress.

Description of the Engine

The Model 447-B engine is a four cylinder radial engine of the reciprocating piston type operating on the four-stroke cycle. The engine employs the Fairchild Caminez drive cam mechanism in which reciprocating motion of the pistons is converted into rotary motion of the propeller shaft by means of rollers in the piston operating on a double lobed cam. The mechanism is such that each piston completes four strokes per revolution of the propeller shaft. With the four stroke cycle that is used, each piston, therefore, completes a power stroke every revolution of the shaft. It is due to this that a high power output is obtained per cubic inch of piston displacement at a low propeller speed, the shaft speed in this engine being one half that of a crank engine of equal piston displacement for the same power output. Another important difference of this cam engine from the usual crank engine is that the motion of the pistons in opposite cylinders of the cam engine is identical with respect to the engine axis, so that the piston inertia forces balance each other. Perfect running balance is, thereby, obtained without the use of counterweights, the cam engine being the only radial or four-cylinder engine in perfect inertia balance.

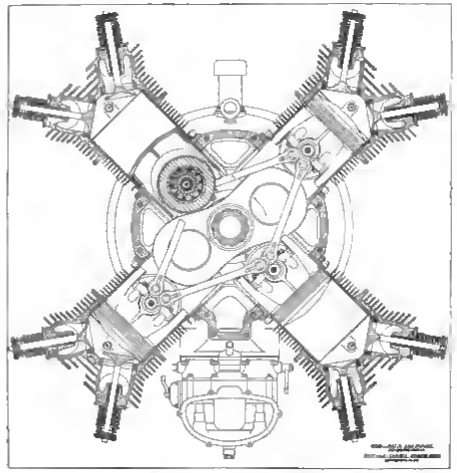
A general view of the Avro 504K (with a somewhat modified undercarriage) fitted with the Fairchild Caminez engine. The propeller is a Curtiss Reed.

In the Fairchild Caminez engine, the four cylinders are arranged radially about a central rotatable cam as shown in Figs. 1 and 2. This cam is of the double lobed type, shaped generally like a figure 8. A roller bearing is mounted in each piston, the outer race of which acts directly upon this drive cam. Adjacent pistons are connected by a system of links, the contour of the drive cam being so designed that these links maintain the piston rollers in continual contact with the cam.

Main Shaft

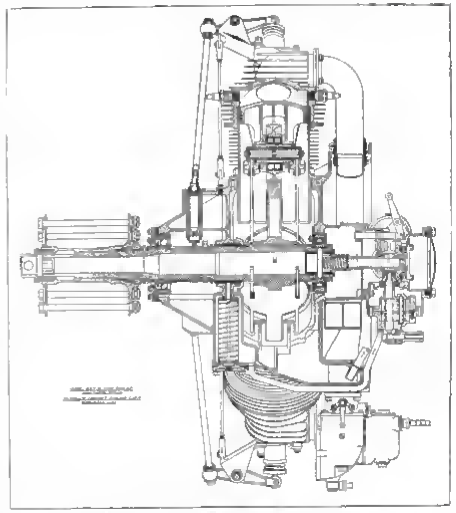
The main shaft of the engine is a straight alloy steel shaft to which the drive cam is splined. This shaft is supported in the engine case at the rear end by a roller bearing. The front main shaft bearing is a deep groove radial ball bearing which takes all the thrust load on the shaft and part of the axial load. The center plain bearing on this shaft is fitted with large clearance so that it takes but little of the axial load and acts mainly as a means of transmitting the lubricating oil from the case to the shaft, from where it is distributed throughout the engine.

The main engine casing consists of two aluminum alloy castings which are bolted together at the plane through the cylinder axis, eight long studs being employed to hold the casing together. The front, or propeller end casting holds the valve cam followers. The engine auxiliaries, which consist of two magnetos, pressure and scavenging oil pumps, and tachometer drive, are contained in a separate casting that bolts to the rear main engine casing. The engine is mounted in the airplane by means of the rear flange on the engine casing, provisions being made for eight ⅜ in. diameter bolts. The diameter of this mounting flange is 20 in. and the necessaries behind this flange are so arranged that no connection on the engine need be disturbed when installing or removing the engine from the airplane.



A detail plan section drawing of the Caminez engine showing clearly the cam mechanism operating the pistons.

Four openings are provided in the engine casing which receive the various cylinders. These cylinders consist of hardened steel finned barrels which are screwed and shrunk in special aluminum alloy heads. Bronze inserts are shrunk in the heads for valve seats. Phosphor bronze valve guides are used. The tulip shaped exhaust valve is 2¼ in. diameter, and the mushroom inlet valve is 2½ in. diameter, both valve lifts being 9/16 in. Pressed steel valve rocker brackets are bolted to the cylinder head at their rear end and attached to the engine case at the front end by a long rod, the construction being such that a firm support for these brackets is obtained without putting too much of the push rod load on the cylinder head casting. The valve rockers are alloy steel drop forgings and have hardened steel rollers which contact on the valve stems. The push rod ball ends are contained in grease tight adjustable screws in the rocker levers, the screws providing means for obtaining proper valve tappet clearances.



A detailed side elevation section drawing of the Caminez engine showing the propeller shaft and piston arrangement.

Provisions are made to lubricate the push rod ball ends through alemite connections in the rocker pivot bearings.

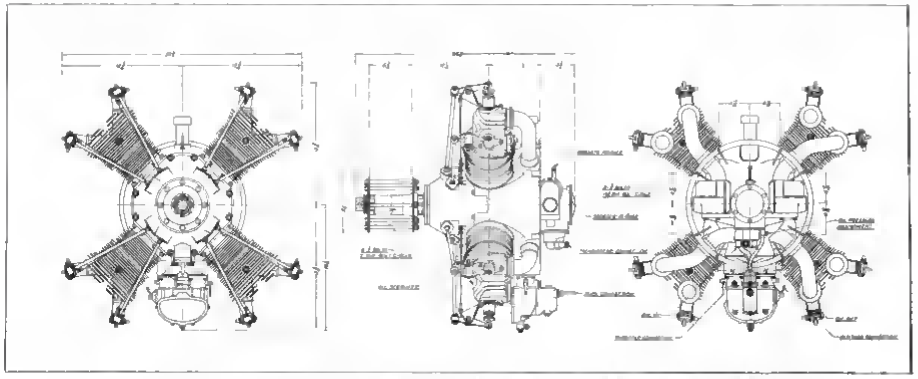
Since each piston makes four strokes per revolution in the engine, single lobed intake and exhaust cams are mounted directly on the main engine shaft which operates all the valves in the engine. The valve tappet plungers are contained in removable aluminum alloy guides which fit in the nose end of the main engine casing. Rollers are mounted on floating hardened steel pins in the end of the tappet plungers which contact with the valve cams. Small holes drilled through the main engine shaft throw jets of oil on these tappet plunger rollers for lubrication.

Pistons and Bearings

The pistons are made of heat treated aluminum alloy and are provided with four narrow compression rings. The pistons are of the slipper type with large bearing areas on their thrust sides. Deep ribs are provided to strengthen the pistons and improve piston cooling. Special double row roller bearings are mounted in each piston, the piston being made with detachable caps to facilitate assembly. A piston pin passes through the hub of these roller bearings at the ends of which link holders are fastened. The links inter-connecting the pistons, consist of alloy steel straps. They have hardened steel pins keyed at their ends which work in bronze bushings in the piston link holders. Ample bearing area is provided for these pins to reduce the unit bearing loads in the bushings. Lubrication of these bearings is obtained by oil jets in the main engine shaft which register with these bearings at every bottom stroke of the piston. The loads on these links and link pin bushings are due to the inertia force of the piston assembly away from the cam. The cam is so shaped that there is a practically constant load on these links at any given engine speed. The links and link bearings are designed with the same generous proportions used throughout this engine.

and have a factor of safety of 10 at the rated speed of the engine

The engine auxiliaries are assembled as a unit in the casting which bolts to the rear of the engine casing. The magnetos and oil pumps are driven by bevel gear pinions which mesh with a single bevel drive gear in the auxiliary housing. This bevel drive gear is connected to the main engine shaft by means of the auxiliaries drive shaft. This shaft has a straight spline on its rear end which engages with the bevel drive gear and a spiral slot at its front end through which it is driven by a hardened pin in the main engine shaft. This auxiliaries drive shaft can be moved back and forth by means of the yoke and lever provided. The movement of this shaft rotates the bevel drive gear with respect to the main engine shaft and is used to retard or advance the magnetos. This shaft is normally held outward by means of a spring in which position of the shaft the magnetos are fully advanced. Pulling the shaft inward retards the magnetos. The engine starter dog also engages with the splines in the bevel drive gear, but the arrangement is such that when the starter dog comes into engagement, the magnetos are automatically retarded.



General drawings of the Fairchild-Caminez engine giving details required for mounting and building a suitable cowling

Lubrication

The pressure and scavenging oil pumps are of the spur gear type and are contained in a single unit which also holds the tachometer drive shaft. The oil pumps run at twice engine speed and the tachometer at half engine speed. An oil pressure relief valve is contained in the oil pump housing. The oil pressure pump draws oil from an outside tank and delivers it to a compartment containing the oil strainer through which the oil passes before it enters the engine shaft. This strainer is made so that the oil will by-pass around the screen should this become clogged. The scavenging oil pump draws the oil from an oil pump made integral with the rear engine casing and delivers it to the oil tank.

The intake manifold is an aluminum casting which fits in the rear engine casing. Two separate passages are contained in this manifold which connect to the separate barrels of the Stromberg duplex carburetor through short pipes that pass through the oil pump of the main engine casing, the carburetor being bolted directly to the case beneath the oil pump. This connection is arranged so that opposite cylinders draw from the same carburetor barrel so that maximum ramming of the induction charges together with good distribution are obtained.

The steel propeller hub is splined to the main shaft and is centered on it by a split hard bronze cone. A backing-off nut is provided in the hub so that it may be readily removed from the engine.

The detail design of the engine has been executed with the view of extreme durability and ruggedness rather than minimum weight. The comparatively low weight per horse power is obtained in the engine by virtue of the compactness of this type of engine, together with its fairly high ratio of power output to piston displacement. Ample factors of safety have been used in the design of all detail parts, liberal bearing sizes have been used throughout, and the wall thicknesses of castings and hollow steel parts have been made much greater than is at present found in aircraft engine construction. The resulting detail engine parts are sufficiently heavy and rugged to minimize distortion in machining and assembly, and the use of such construction is a major factor in lowering the cost of manufacture and maintenance of the engine.

Specifications

The general details of the engine are as follows:

- Weight (complete with propeller hub and all accessories except starter)—360 lb.
- Bore—5 5/8 in.
- Stroke—4 1/2 in.
- Piston Displacement—447 cu. in.
- Compression Ratio—5.2 : 1. B.M.E.P. 100 lb./sq. in.
- Ignition—Two four-cylinder magnetos with two spark plugs per cylinder.
- Carburation—One Duplex carburetor, Stromberg NA-U 5.
- Lubrication—Pressure, with dry pump. Gear type pressure and scavenger pumps.
- Starter—Standard U. S. Air Service starter flange provided for mounting hand or electric starter.
- Bearings—Anti-friction ball and roller bearings.

Special Features of the Engine

Some especially interesting features of the design of the Caminez engine will now be discussed.

1 Development of rated horse power at low propeller r.p.m., without sacrificing high power output per unit of piston displacement.

Due to the fact that each piston of the cam engine makes four strokes per revolution instead of two as in the crank engine, the cam engine has the advantage of a geared engine without incurring the increased complexation, weight, and cost of a propeller reduction gearing. Low propeller r.p.m. is thereby obtained with high power output per unit of piston displacement, which is particularly advantageous where improved airplane performance in take-off, rate of climb, and cruising radius is desired.

2 Complete balance obtained in 4-cylinder engine.

With the piston motion caused by the cam, the inertia forces in the 4-cylinder cam engine are completely balanced without the use of counterweights or any additional mechanism. This makes the cam engine the only 4-cylinder engine in perfect running balance and it is the only radial engine that does not require balance weights to effect inertia balance. The smooth running of this cam engine and the absence of vibration makes it possible to employ a 4-cylinder engine for high power outputs.

3 Adaptability for air cooling with minimum head resistance and maximum visibility.

The four cylinder X arrangement lends itself admirably to air cooling. Moreover, the cam mechanism allows a more compact arrangement of cylinders, so that the overall diameter is considerably less than that of the conventional radial of equal power output. This small overall diameter, together with the wide gap between adjacent cylinders results in a small projected frontal area and allows good visibility. The excellent streamline shape of the main engine case and the absence of engine accessories projecting into the streamline, also reduces the head resistance. The installation of this engine requires no engine cowling and the engine will cool satisfactorily at full throttle in a 30 mile air blast.

International Newsreel

Harold Caminez (right) and Sherman Fairchild holding a section of the Caminez engine showing the cam gear

4 Simplicity of construction and few number of parts.

Simplicity of construction is obtained with the cam mechanism as the cam and rollers are more easily manufactured and installed than the crankshaft and connecting rods which they replace. Also, due to the fact that the main shaft of the cam engine turns at one-half speed, the valve cams may be mounted directly upon it; thereby eliminating valve gears and intermediate shafting. The fact that 4 cylinders can be employed and still maintain smoothness of operation and perfect engine balance is another factor that greatly simplifies the engine by reducing the number of parts required. The simple construction, combined with the exceptionally small number of engine parts is a decided advantage both in manufacture and in maintenance, and makes possible the low production cost of a high quality aircraft engine.

Low Weight Per Horsepower

5 Low weight per horsepower with sturdy detail construction.

Low weight per horse power is obtained by having an engine of very compact construction, and by obtaining a reasonably high power output per unit of piston displacement. The compact construction is a feature of the cam mechanism and is obtained in the engine without any sacrifice in accessibility or reliability. The relatively small number of engine parts, combined with the compactness of the engine, allows the employment of strong, sturdy detail construction without too great an increase in weight per horse power. The wall thicknesses of all castings and forgings used in the cam engine are considerably larger than usually found in aircraft engines, thereby facilitating machining and preventing damage occurring in handling.

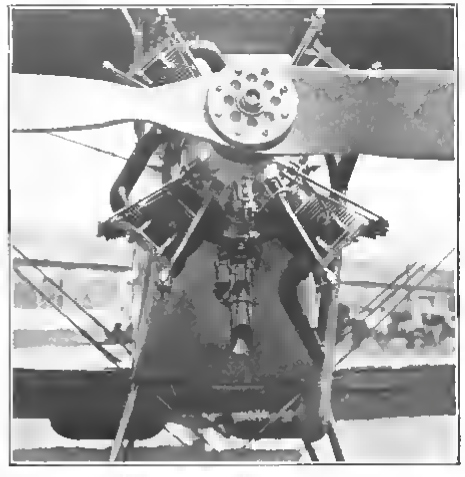
6 The use of ball and roller bearings throughout, decreasing friction, increasing reliability, and making for easy maintenance and replacement.

In the cam engine, it is extremely easy to use ball and roller bearings throughout, the difficulty of mounting such bearings as in the conventional type of crank engine being entirely absent. The employment of anti-friction bearings simplifies the manufacture and assembly, doing away with the usual scraping and fitting of bearings. Another advantage of these bearings besides the decrease in friction, is an increase in reliability, as these bearings are not effected by temporary lack or change in viscosity of the oil. The oiling system is also greatly simplified, as no direct lubrication of these bearings is required. Starting the engine in cold weather is considerably facilitated, as the congealing of oil at low temperature does not sensibly increase the effort required to rotate anti-friction bearings.

Maintenance

7 Accessibility and ease of maintenance.

All accessories on the engine are readily accessible and can be removed without disturbing the engine installation. The unit cylinder construction, and the employment of anti friction bearings greatly facilitates the maintenance. The simplicity of the engine, together with the small number of parts, minimize the time required for assembly and overhaul, it being possible for two men to completely disassemble, inspect, and reassemble the engine in an eight hour day, without the use of special tools or equipment.



The Fairchild Caminez engine mounted in the Avro plane

8 Maximum reliability and long life of engine.

The engine is constructed with ample factor of safety throughout. There are no highly stressed parts in this engine as found in the modern designs of conventional engines. Liberal sized bearings are provided throughout. The unit bearing loads on pistons and bushings are conservative. In the preliminary 50 hour test of the first experimental engine, no measurable wear was found on any of the engine parts. As it is unnecessary to resort to flimsy detail construction to obtain low weight per horse power in the cam engine, more attention can be given in design to obtain reliability and long life.

Two New Wissler Airplanes

Two Low Power Touring Airplanes.

THE WISSLER AIRPLANE COMPANY of Bellefountaine, Ohio, has recently produced two interesting airplanes of comparatively low power which have successfully passed their tests. Both planes were designed by C. H. Wissler, aeronautical engineer, who has been interested in aviation since 1909 and has designed and built many experimental airplanes. Little has been heard of his work, however, since a great part of it has been along experimental and research lines covering wind tunnel tests, stress analysis, propeller design, etc.

The first of the two planes to be described is the WA-6. It is designed as a sport plane and is said to be very easy to fly and very economical in upkeep. The engine, an Anzani 75 hp. air-cooled radial, takes about four gallons of gasoline and ¾ gal. of oil per hour.

Constructional Details

The machine is a tandem two-seater single bay biplane. The main planes are wood and wire construction and covered with standard grade A cotton fabric, doped with four coats of clear acetate, two coats Buff Titanna and finished with two coats of Valspar varnish. The main spars are I section spruce and are backed with 3/32 in. steel the entire length for extra strength on account of the very thin wing section used. The ribs have white pine webs lightened out and have spruce cap strips. Each wing panel has four box ribs to take compression of the high tensile steel wire used for internal drag bracing. Ailerons are mounted on top wings only. No center section is used, the top wings joining over the center line of fuselage and being mounted on four short struts cross braced with aircraft cable.

Like the main planes, the horizontal stabilizer, elevators and rudder are of wood and wire construction. The rudder is of the balanced type. All ribs, both in the main planes and in the tail surfaces, where joined to the leading and trailing edges, are reinforced with copper strips. Side stress in the ribs is taken care of by tapa in Pratt truss form running the entire length of each wing panel in four different places. The tail surfaces are braced in a like manner. No fixed vertical fin is used on this plane.

The fuselage is also of the usual wood and wire type, the longerons being ash from the rear cockpit forward and of spruce to the rear. The fuselage is covered with aluminum from the engine bed plate at the nose to the back of the rear cockpit and from that point to the rudder post the covering is cotton fabric. Dual control is installed and both cockpits have ample room and comfortable seats. The engine is mounted directly on the heat treated nose plate and is readily accessable at all times. In fact, the engine can be dismounted from the plane in less than half an hour by one man. The gasoline and oil tanks are mounted in front of the front cockpit and are easily removed if used he. All necessary instruments are mounted in both front and rear cockpits.

The Landing Gear

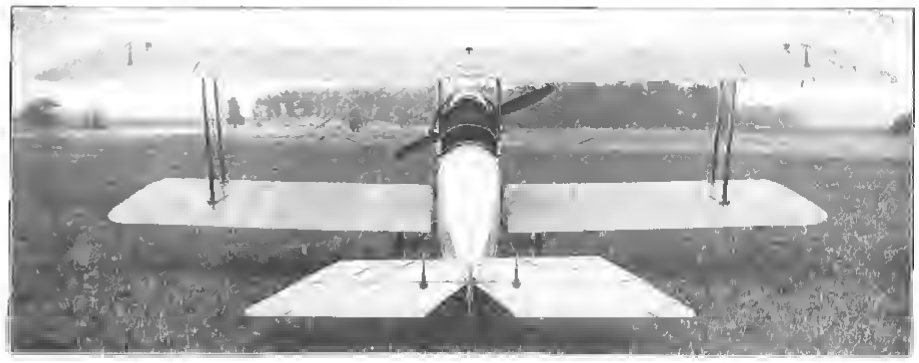
The landing gear is of the conventional two wheel Vee type with straight rigid axle, rubber sprung. Vee's are of streamline spruce reinforced with steel plates lightened out. The tread of the wheels is 5 ft. and wheels are wire with 26 in. by 3 in. cord tires. The tail skid is of ash and rubber sprung and so mounted to give proper drag without undue stress on the rear of the fuselage.

All bracing and control wires are of Roebling's aircraft cable of proper size to insure ample strength in all cases. Flying wires are double and landing wires are single. Owing to the short span of the wings, no drift wires are necessary, which fact cuts down the resistance and, therefore, adds to the high speed. The horizontal stabilizer is braced from below with steel tube and the rudder is braced with solid steel wire from the hinge line to the top of the stabilizer on each side. All control wires are exposed which, of course, renders inspection of these a matter of ease.

Performance

The airplane has, apparently ample power with the 75 hp. aircooled Anzani 6A-3, radial engine. During the experimental tests of the machine, the engine was throttled down from the normal speed of 1500 r.p.m. to 1100 r.p.m. and the plane continued upon an even keel with hands off. The balance of the plane is such that very little movement of the controls is necessary. On one occasion, when the engine was cut at an altitude of 5400 ft., the ensuing glide extended for a period of 28 min. before the landing was made, which gives some indication of the flat gliding angle of the airplane. In a case of engine failure, this should give ample time for the location of the most suitable landing place. On another occasion during the tests, it is said that, when stalled, there was no tendancy for the machine to fall off on one or the other wing tip. And, lastly, the machine was shown to possess ample controlability and maneuverability during the tests.

The Wissler WA-6 two seater touring airplane with 75 hp. Anzani 6A-3 air-cooled engine



Rear view of the Wissler WA-6 (Anzani 6A-3, 75 hp.)

The general specifications and details of the Wissler W-A 6 are as follows:

Span, top wings	27 ft.
Span, lower wings	24 ft.
Chord, both wings	4 ft.
Wing section	Wissler 16
Wing area, including ailerons	184 sq. ft.
Area, both ailerons	16 sq. ft.
Area, stabilizer	10.5 sq. ft.
Area, both elevators	12 sq. ft.
Area, rudder	5 sq. ft.
Wing Gap at center	4 ft. 3 in.
Wing Gap at strut	4 ft.
Stagger	8.75 in.
Incidence	3 deg.
Dihedral, top wing	1 deg.
Dihedral, lower wing	2 deg.
Length, overall	19 ft. 3 in.
Height, overall	8 ft. 3 in.
Weight, light	736 lb.
Weight, fully loaded	1208 lb.
Useful load	472 lb.
Gasoline capacity	13 gal.
Oil capacity	3 gal.
Duration	3 hr.
High speed	120 m.p.h.
Cruising speed	85 m.p.h.
Landing speed	40 m.p.h.
Climb in 1 min.	700 ft.
Climb 10 min.	5000 ft.
Wing loading	6.5 lb./sq. ft.
Power loading	16 lb./hp.
Factor of safety	7

The Wissler WL-9

The Wissler WL-9 is also a two-seater machine and a single bay biplane but the seating arrangement is side by side. The main planes are of the usual wood and wire construction covered with grade A cotton fabric and doped with five coats of clear acetate, Valspare and finally aluminumized. Main spars are spruce of rectangular section. Ribs are of Pratt truss type and have spruce cap strips with truss members of the same material. Each wing panel has four compression ribs of solid ¾ in. spruce webs and spruce cap strips. Internal drag bracing is of high tensile steel wire. Ailerons are mounted on the upper wings only and are of ample size to insure control. As in the WA-6, there is no wing center section. The top wing panels meet over the fuselage center line and are mounted on a cabin of four short struts cross braced with aircraft cable. Side stress in the ribs is taken care of by tapa cross bracing in Pratt truss form the entire length of each wing panel, in four places.

The stabilizer, elevators, fin and rudder are of wood, wire and steel tube construction. The main spars of these members are of wood, cross braced with wire and the leading and trailing edges are of oval steel tubing.

General Construction

The fuselage is rectangular in section and braced with aircraft cable forward of the cockpit and with spruce members to the rear. The sides are covered with plywood and the turtleback and bottom of the fuselage are covered with fabric. The longerons are spruce, as are the horizontal and vertical struts. The plywood covering is in three sections and of different thickness. The front section, from the cockpit forward, is ¼ in. thick, the middle section is 3/16 in. thick and the rear section is ⅛ in. thick. All plywood is birch three-ply. As stated the cockpit is arranged for side by side seating so that the passenger can, at all times, converse with the pilot. This feature also makes this plane very suitable for training students to fly as every move made by the instructor can be seen by the student. Either dual or single control can be used. The engine is mounted directly on the usual steel bed plates used with rotary engines. The engine, an 80 hp. Le Rhone rotary, is very readily accessable. Gasoline and oil tanks are mounted forward of the cockpit and are easily removed if necessary. The instrument board is furnished with all necessary instruments.

Undercarriage

The chassis is the conventional Vee type and has a hinged axle, rubber sprung. The Vee's are of steel tubing, faired with Balsa wood. Tires are 26 in. by 3 in. on wire wheels with a tread for the undercarriage of 5 ft. The tail skid is ash, metal shod and so mounted to cause no undue strain on rear of the fuselage.

All bracing and control wires are Roebling standard aircraft cable of a size to insure ample strength under all conditions.

On the test flights of the WL-9 the climb was proved to be better than 1000 ft. per min. with a ceiling of 18,600 ft. The average take off was accomplished in 110 ft. with pilot alone and in 200 ft. with a passenger. Even with a 280 lb. passenger, the take off distance was only 230 ft. and at a distance (straight away) of 500 ft. from a standing start, the plane had climbed to a height of 150 ft. On another test, the plane attained a height of 400 ft. in a distance of 1000 ft. straight away and the pilot held the plane on the ground for a 200 ft. run. The length of run upon landing was found to average 140 ft. The above figures are taken from actual tests and are not estimated.

In these and other tests the plane was stalled and showed no tendency to spin. Control and stability were good at all speeds, with power both on and off. The plane has a flat glide of 1 in 10.

The Wissler WL-9 two seater touring plane with 80 hp rotary Le Rhone engine

The general details of the WL-9 are as follows

Span, both wings	32 ft.
Chord, both wings	4 ft. 2 in.
Wing Area, including ailerons	244 sq. ft.
Area, both ailerons	20 sq. ft.
Area, stabilizer	17 sq. ft.
Area, both elevators	17 sq. ft.
Area, rudder	8.5 sq. ft.
Area, vertical fin	3.5 sq. ft.
Wing gap at center	5 ft.
Section	Modified U.S.A. 27
Length overall	20 ft. 8 in.
Height	8 ft. 3 in.
Weight, light	922 lb.
Useful load	545 lb.
Total weight loaded	1477 lb.
Gasoline capacity	20 gal.
Duration	3.5 hr.
High speed	95 m.p.h.
Cruising speed	80 m.p.h.
Landing speed	30 m.p.h.
Climb in 1 min.	1000 ft.
Climb in 10 min.	7500 ft.
Wing loading	6 lb./sq. ft.
Power loading	18.5 lb./hp.
Factor of safety	8

New Planes for Transcontinental Mail Service

Postmaster General New has awarded to the Douglas Company of Santa Monica, Calif., the contract for furnishing forty airplanes for use in the government operated transcontinental air mail service between New York and San Francisco. The Department will pay $11,900 for each plane. Under the terms of the contract, delivery shall begin within sixty days from the date of its acceptance and the forty planes must be turned over to the Department within 160 days from the date of the contract. When these planes are placed in service, the Department will be fully equipped with sufficient planes better to maintain its schedules over the transcontinental route. They will supplement the seventy-five planes, now in serviceable condition, which are being employed in maintaining the Government's air mail service.

Each Douglas plane will be equipped to carry a pilot and parachute, weighing together 190 lb., 130 gal. of gasoline, weighing 780 lb., 12 gal. of oil, weighing 90 lb. and a mail load of 800 lb. With the standard air mail night flying equipment, each plane must maintain a maximum speed, level flight at sea level, of 135 m.p.h. and a landing speed of 55 m.p.h. A cruising speed of 115 m.p.h. must be maintained and the rate of climb at sea level will be 1,000 ft. per min.

Front view of the Wissler WL-9 plane (Le Rhone, 80 hp.)

Four Year's Flying

By F. B. IRVINE, Linton, N. Dak.

While there is nothing original about my experience or methods, yet, if I can say or do anything to help a younger pilot, it will be time well spent.

In the fall of 1921, I became the proud possessor of a Jenne, having traded a car and some boot for one that was in pretty fair condition, it having a Hammondsport engine and a heavy club prop. Not knowing how to fly, I hired an Army pilot, who was a good and very careful flier, for the balance of the fall and we barn-stormed on Sundays and holidays, picking up quite a little change as it was a comparatively new thing up in this Northwest country. Later we took in the Pulitzer Trophy races at Omaha. This was a very enjoyable cross country trip, taking pictures from the air all the way down and back, but, on our return trip, we got caught in a snow storm and carelessly froze the engine up, which delayed our return until Nov. 14. We arrived home with considerable snow on the ground and in rather chilly weather. I let my pilot go for the Winter but he returned in the Spring to train a student of twenty-one who had come out from the East.

What Age Limit For Pilots?

Of course, my ambition was to learn to fly but my pilot said it would be out of the question as I was too old, I being, at that time, forty-four years of age. However, during that Winter, I had written to many of the aviation schools and all advised me that if I had my five senses there was no doubt that I could learn although it might take a little longer than in the case of a younger person. One of them had taught a person over sixty years old, to fly, so I insisted on taking training and found my greatest trouble was in learning to make the proper banks on the turns but this seemed to come to me all at once and I had no difficulty after that.

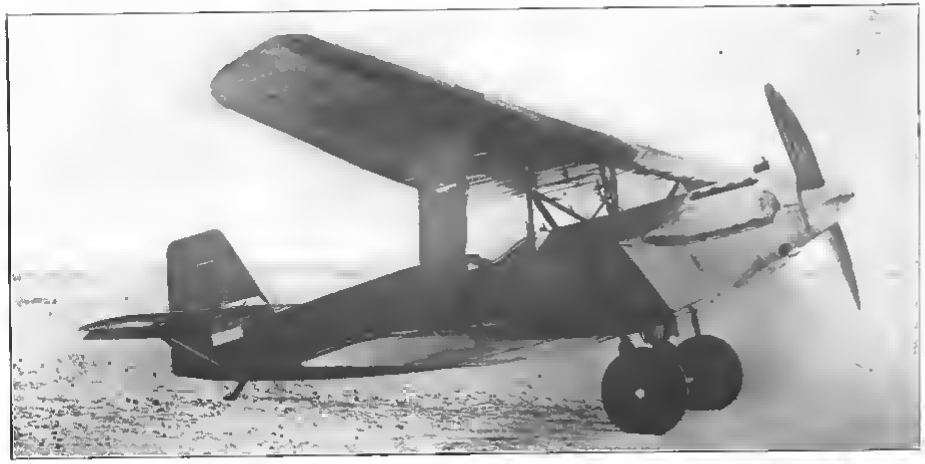
During the Summer, the wind blew my plane away, but I immediately purchased another second-hand Jennie, although I had put in a bid for a new one which was being sold by the Army. My bid was accepted so I found myself with three planes on hand, one with the fuselage and tail surfaces somewhat badly wrecked but which we afterward built up. During that fall, my student washed out one of them by hitting a telephone pole, when taking off, and the next Summer, (1923) a pilot whom I engaged to fly my new plane for July 4, broke up three wings and the prop on it. This was a pilot who claimed to have had 2500 hr. flying and to have flown several different kinds of planes. He let the engine slow down, lost his flying speed and cracked up the plane. After that, I made up my mind I would crack up my own planes instead of hiring someone else to do it, and I am thankful to say that, since that time, all I have broken is a couple of props, one from nosing over and the other from landing with one wheel off. Incidentally, that taught me to look and see if there were pins in the axles after that. One needs a "jolt" once in a while or one will get careless.

The Stages of Flying Experience

The first pilot I had, said there were three stages in flying. First, the beginner's; second, the intermediate, when one had learned a good deal but was still very careful and cautious, and the third, the time when one became convinced that "there's nothing to it". He said, the third stage was generally the time when one cracked up, and the more I see of it, the more I am firmly convinced that he was correct. I sometimes find myself getting over into the third stage when something will bring me smartly back to the second,—a forced landing, a bad landing or something of the kind.

I saw a pilot, who had flown seven years, bump into a hay stack last Summer while taking off, after having flown out of the field for two days during an aviation meet. It was very humiliating to him for it was just carelessness.

Well, I have flown all the supposedly inefficient war surplus, the JN, the Canuck and the Standard. I have sworn off on Jennies for this altitude with our high winds prevailing most of the year. I like a good Canuck and we have one now that takes off like a Hisso Standard. Down South, they fly OX5 Standards and carry two passengers but not for me—give me a Hissol. From everywhere came the report, "valve trouble", "valve trouble", in connection with this engine, but we have had several the past year and flown them continuously and have had no trouble with blowing valves. Of course, we are careful. We warm them up gradually and cool them off the same way and do not "gun them". The first one we got, the owner told us to "fly it in" at 1000 r.p.m. Well, I figured out what I thought was a better way than that. We usually give passengers about a twelve minute ride and get our altitude quickly,—about 1000 ft. in five minutes. Then we begin to gradually close the throttle and we will still climb some, attaining about 1500 to 1800 ft., depending on the air, all the while gradually throttling down. When we turn to come into the field, we have about 500 ft. and the engine is just idling along nicely, and when we reach the ground it is just turning over.



The A.F.G.1 with Napier Lion, 450 hp. engine. This is said to be the first plane constructed in Lithuania, Europe. The machine is reported to have a speed of 160 m.p.h. and to be capable of a climb to 17,000 ft. in 17 min.

Our price for carrying passengers has been, invariably, five dollars for twelve minutes and we have walked away with the business with a Hisso Standard at a picnic, where some of the others were charging only three dollars, because we gave them a real ride and some altitude. We have seen so many go out and carry for three dollars each, have a little crack up or two and wind up the season with a depreciated engine and plane and no money in their pockets. Of course, if one does not have to depend on that for a living, it is a little different. Like some of our farmers raise a bunch of cattle to pay the expenses of farming. We made a price of three dollars once on our home field but it did not attract any new business but we earned several that we are satisfied would have paid the five just as quickly. One has got to figure a margin in this game, as in any established business, but so many pilots figure that if they took in fifty dollars and paid twelve for gas and oil they are thirty-eight dollars to the good. We have had the girls and women climb a barbed wire fence six feet high at a fair to come out and ride when they knew we were charging five dollars and others had carried them, in the same town, at three. We do not stunt with passengers as we do not figure that it promotes the game.

Useful Hints

Some of the kinks we have learned, while not new to the older pilots may be of some use to the more recent graduates. We used to be troubled continually with the exhaust push rod yokes breaking on the OX5's until we took a Ford steering gear connecting rod tube and sawed some rings off it about an eighth of an inch wide, or three sixteenths, and drove them on the rounded portion of the yoke and that ended the trouble. Our finish would not stand the weather until we dusted aluminum powder on the varnish just when it was real "tacky". Then it would shed water and dew like a duck.

At one fair, we were supposed to land inside the race track, but, when we arrived, the field was full of polo stakes, so we dropped down in a small field close by and ran into the fence, breaking up the right forward corner of the lower wing. We had no dope, no fabric or needle but the latter was easily secured and we found that there was a paint shop in town equipped to put the lacquer finish on automobiles, so we procured about a quart with which we fixed up the break so that one would hardly have known it had been broken.

Being continually out in the weather sometimes causes the trailing edges on the Standard control surfaces to open up and warp from the moisture. In some cases, we have cut out all the laminated trailing portion procured some one inch copper, brass or aluminum tubing of light gauge, run it through a tinner's roller and flattened it down to about a half inch thick, cut a notch in each end to slip it on to the remaining portion of the trailing edge, sewed up the linen and, with some tape, made a very presentable job which will warp no more. For the curved ends of wings and ailerons we have used the smaller copper tubing with good success. It can be bent to shape easily, yet holds its form well.

How Planes Get Blown Away

Our severe winds accompanying a thunder storm usually come from a westerly direction and, as there is a rather steep hill on the Southwest corner of our field, we have dug trenches into this, the width of the track, and run our planes into them, securing them with ropes. We left one untied one day, while we came up to dinner and a strong Northwest wind came up and blew it backward down into a ravine about two hundred yards away breaking nothing but one of the loops of shock cord on the tail skid, allowing the tail skid to turn around. But we said—never again!

I believe that a great many who are condemning the war surplus material have never flown a Hisso Standard. The weakest spots on the Standard, that we know of, are the wing fastenings to the fuselage. These we have trussed up with a couple of cables from inner strut to insure strut, underneath the fuselage. Two of these cables, with good turnbuckles, would help a lot. We knew of one party who could carry twelve "cases" and over fifty gallons of gas, with this arrangement. With one of these planes one can stick the leading edge of the lower wing up on the horizon and climb, I'll say. You do not need to worry about stalling.

We find a lot of young fellows who would like to learn to fly—even like to build their own plane—if they only knew that it is not so difficult as they imagine. If some of the companies would put out some blue prints for a nice little sport plane with specifications and instructions as to how to build it, and an engine at a reasonable price, many of the boys would be "rolling their own", much as they do their radio sets now. But, with engines at $600 to $1200 each, it is still out of the question. OX5's could be bought very reasonably but they are rather large and not very economical for a light plane. A single-place plane is not very practical, as one usually wants a companion and, in any case, how could we teach them to fly it. We bought a Spad fuselage and contemplate building a set of high lift wings for it and using an OX5 engine with dual control, side by side seating, as it is wider than a Standard. We have reason to believe that this will make a classy little plane if we ever get around to building the wings.

It is really surprising that practically everyone thinks that it takes an aerobat or a kind of a superman to be able to fly, while it is really much easier than driving a sliding gear automobile, but the next generation will all be "up in the air", so, we should worry. People are beginning to find out that a great deal of the propaganda spread during the war is mostly hunk, that an engine does not need overhauling nearly as often as purported and that the life of them is a great deal longer.

Must bring this ramble to a close and hope to read the experience of some other amateurs.

Airplane Dusting Experiments

Considerable success has attended the experiments of the United States Department of Agriculture in the use of the airplane as a means of distributing poison dust over both treeless and wooded swampy areas for control of malaria mosquitoes. In the final tests, more than 99 per cent of the larvae in the area treated were destroyed with one application. Paris Green was the larvicide used in all the experiments.

In developing the method of handling the planes so as to distribute the dust properly and in determining the quantity of Paris Green to use, flights were made first over open fields, then over dry woods, and, finally, over various types of mosquito-breeding swamp and lake areas.

With an experienced pilot, and when careful attention was given to the spread of the dust, no special difficulty was encountered in distributing it over the treeless parts of the lakes. Furthermore, from a single experience in treating rice fields, this type of breeding place appears to be particularly well adapted to control by airplane dusting, because of the absence of trees and other obstructions which interfere with close flying. Even in such places as the heavily wooded areas where the water was protected by dense overhead foliage and where the planes had to be flown high enough from the ground to clear the tallest trees, the dust was found to have penetrated the thick growth and to have reached the water in sufficient quantities to destroy the larvae.

The quantity of Paris Green used in the experiments varied from about one twentieth of a pound to several pounds per acre. Because of the small amount of poison required to kill the larvae, the Paris Green was mixed with an inert dust of some sort, finely ground silica earth being the carrier used in most cases.

In each test a series of pans containing known numbers of larvae were distributed over the area to be dusted. Counting the living larvae after dusting, furnished a check on the effectiveness of the application.

Two final tests gave particularly clearcut results, and for this reason were of special interest in showing the possibilities of this method of control in breeding areas of the type represented, the lakes overgrown with aquatic vegetation and having an abundance of Anopheles larvae well distributed throughout. In the first of these a larval reduction of 88 per cent occurred as a result of the treatment, and in the second more than 99 per cent were killed. The only larvae remaining in the second instance were a few of the smallest size found in one small spot.

"Side Slips"

By Robert R. Osborn

At the time of this writing the North Pole seems to have been successfully rediscovered at least once, and possibly twice. Lieutenant Commander Byrd is back from his splendid flight, the Norge is off with Amundsen and Ellsworth, and Captain Wilkins is impatiently waiting better weather at Point Barrow. We were expecting that, at least one of the numerous expeditions would be successful so we were prepared for that news, but we are more than amazed at the newspaper pictures of the machine in which Commander Byrd flew. If the advertisements and illustrated news stories that were hurried to press can be believed, he made his famous flight in four or five different machines, probably changing nimbly from one mount to another like the pony express riders of old. There were all sorts of weird portrayals of Fokkers with ironing board skids, rebuilt Jennies with gentlemen making observations near the stern-post and Martin Bombers with six or seven cockpits.

One photograph had been taken with the engine apparently warming up so that the propellers had not appeared. To remedy this deficiency some artist cleverly faked in some propellers which, estimating roughly, would have had a ground clearance of about minus two feet. Another drawing of the internally-braced monoplane had so many struts to the wing that it would have been a jolly game of hide and seek, taking about four hours, for the pilot to find his cockpit. Lieutenant Commander Byrd is to be congratulated not only for his flight to the Pole but for his miraculous escape from death if he flew any of these fearful and wonderful contrivances.

* * *

We must admit that we never had any ambitions for polar exploration but we cannot be as indifferent to the news of this accomplishment as is Heywood Broun, columnist of the *New York World*. He compares this expedition unfavorably with other romantic episodes in history, finding more romance in the discoveries of Cortez or Columbus, and stating that "Ice is so much all of a piece no matter where you find it." While it is true that there are few trophies and exhibits that may be brought back and that there is probably not more than a two dollar lecture in the whole business, ice is not to be dismissed as lightly as this. It makes all the difference in the world whether the ice is inside your boots and down the back of your neck or tinkling in the glasses on the table.

* * *

We have always wondered what people thought about when they were exploring deserts, scaling cliffs, hunting wild animals and other ventures of that sort. Messrs. Byrd and Bennett can clear up this vital question once and for all if they will be perfectly frank about their experiences. What we want to know is: Did they spend the majority of the fifteen and one-half hours in discussing the scientific aspects of the flight or were they talking over the batting average of Joe Smith on the home town ball team and telling each other of places where big trout could be taken out by good fishermen?

* * *

These Arctic news reports would be a lot more interesting if they were not just prosaic statements of fact. How much more romantic will it be if Captain Wilkins announces his crossing the Pole by broadcasting "I'm Sitting On Top Of The World" or if the Norge could be welcomed by a group of stranded Eskimos singing "Swing Low, Sweet Chariot". That would be our idea of a real news story.

The world is not slow to take advantage of any new developments and it will be interesting to see how long it will be before numerous "Polar View" hotels will be built for Summer resorts on newly found land and how soon $5.00 hops to the Pole are advertised. If Commander Byrd had not announced right away that no evidence of life at the Pole or on the route had been found, he might have made a small fortune out of the billboard rights in that region.

Two planes of the Japanese Air Service laying a smoke screen during the recent air pageant at Yoyag Field, Tokio, in which more than 100 airplanes and several airships took part.

AIRPORTS AND AIRWAYS

Kansas City, Mo.

By R S Knowlson

The civilian aviators of Kansas City have all finished putting their various aircraft in shape for the Summer's passenger carrying and barnstorming grind Among them is John K La Grono whom everyone calls "Tex", principally because he comes from California and started to fly back in the days when they made a practice of stripping pianos for flying wires

Blaine M Tuxhorn surprised the boys when he brought a mighty good looking six-place cabin job onto Richards field The ship embodies many original ideas emanating from its designer, who intends to use it for passenger carrying work this Summer

The Sweeney School has exactly ninety pupils enrolled at this writing Some sixty-five of these still are in the ground school stage, which is most complete The others are engaged in actual flying under Willard R Wolfinbarger and W F Spencer, flying instructors The new Sweeney airport, in the Fairfax district of Kansas City, Kansas, is undoubtedly the finest topographically in this part of the country

A flying job in Mississippi is being seriously considered by Harry C Long, better known, perhaps, merely as "Shorty" The young man will be missed here if he goes—so will his every-ready Waco

The air mail, technically known as the National Air Transport, Inc, will make its debut here May 12 Ten Curtiss Carrier Pigeons are being used to start the line An excellent hangar has been erected on Richards Field by the Kansas City Chamber of Commerce and everything possible is being done to awaken and maintain interest to the extent of making the mail a success

Kansas City will be the division point on the Chicago to Dallas line In other words, planes will be changed here and a fresh pilot will carry on to the North or South, as the case may be

In connection with Kansas City's new air mail service, it is interesting to note that Pilot Lawrence H Garrison, when flying with the regular United States air mail lines, brought the first air mail here ever flown into Kansas City It happened at the time of the American Legion air meet, Oct 31, 1921

The other mail pilots thus far taken on, aside from Garrison and E P Lott, chief pilot and manager of operations, are: D A Askey, Ardmore, Okla.; Edmund Metucha, Tipton, Ia.; Richard H Fatt, Washington, D C.; R L Dobie, Beeville Tex.; Wayne Neville, Wichita, Kan., and H L Kindred, Dallas, Tex.

The stupidity of low flying over cities was never more thoroughly demonstrated than last Sunday when a pilot and photographer, flying over Kansas City's Union Station, suddenly found themselves without power at an altitude of 600 ft. The wreck was picked up ten blocks South and a block East in the middle of a street That no one was hurt was a miracle

Deer Catching By Airplane

How the grim spectre of the law deprived ten sportsmen of a venison dinner is the disappointing climax of a story brought to Fort Lauderdale by participants in a fishing trip to the west coast aboard the good ship Billy Jr. The story also depicts one of the most thrilling captures of a wild animal ever chronicled, one perfected by Merle Fogg, aviator for Tom M. Bryan, a member of the party

The Billy Jr was anchored in Shark River, a small tributary flowing into the Gulf of Mexico Fogg was dispatched one bright afternoon in his seaplane to the railway station for supplies. He had flown the 35 mile journey and had landed in one of the small lakes which dot intermittently that section of Florida.

A deer grazing on a diminutive clearing near the banks of the lake wandered nearer to the water and became confused when Fogg started his engine, preparatory to taking off. Instead of darting away into the brush, it leaped into the lake and started to swim across to the opposite side. The pilot hastily improvised a lariat with a rope he carried in his plane and circled the terrified animal, which floundered in still greater confusion and fear at the deafening roar of the engine of the machine. Fogg swung his lariat with the dexterity of a plainsman and, momentarily, the deer was struggling to free himself As it struggled in vain its strength became weaker and Fogg was soon able to take it aboard his seaplane in which he whirled back to the Billy Jr

The landing of a whale by one of the fishermen could not have caused more excitement among members of the party than the return of Fogg with his prize. The deer was alive, unhurt and terrified Speculation as to whether it should be killed to satisfy hungry men or brought back to Fort Lauderdale as a living trophy of an unusual chase ran rife

As has often been said and oftener proved, somebody is always about to extract the joy from life. This occasion was no exception, because some of the fishermen were acquainted with the law. They ended all possibility of further debate when they "advised" that the game warden loomed in the offing because the deer hunting season ended March 1.

Within a few minutes Fogg and his seaplane with the captive deer aboard was speeding back to the spot where he had captured it Freed again, it darted into the brush as Fogg shook his head sadly, started his engine and departed.

Fake Mail Pilot

W E La Follette, superintendent, Western Division of the United States Air Mail Service, with headquarters at Salt Lake City, Utah, has advised the Post Office Department that Federal detectives have captured a fake air mail pilot.

The pilot, the superintendent reported, used the names of Jack Gregory, Art Kelly, J C Williams, and Joe Barker, and was charged with obtaining money under false pretenses, impersonating an army officer and Government employees, and also with stealing automobiles

"Jack Gregory," his favorite alias, Mr La Follette said, operated in Oakland, Calif., and Salt Lake City, and was picked up in Bakersfield, Calif., with a stolen Cadillac.

"While being transported into Idaho to face trial," Mr La Follette wrote, "he attempted to escape by leaping from the train but was shot through the side by the marshal and rather seriously injured, but will recover, we understand

"Gregory knew his business very well—knew the names of air mail officials had air mail stationery, and seemed generally well informed on air mail matters."

Fails to Lift 586 lb. Passenger

Emory Titman, who calls himself the world's heavyweight, missed the thrill of his life when his bulky form of 586 lb was too much for a Curtiss seaplane

Titman wedged himself in the machine, a feat in itself, and the pilot, "Doc" Allen, was almost crowded out of his seat. With a large gallery on hand to see a passenger flight record broken, the seaplane taxied to Brigantine bridge, where it was turned around to get into the wind preparatory to taking off The machine skimmed along the water for a quarter of a mile, but Titman's weight was too great a lift.

Experts at the Curtiss station said that they were at a disadvantage. A light wind was blowing and the machine was forced against a strong tide with a heavy ground swell in the channel

Ordinarily the seaplane which carried Titman can accommodate three average passengers The largest passenger it ever carried was a New York policeman, who weighed 365 lb

Cleveland Airport News

By W T Whalock

Evidences of public enthusiasm in Aviation were emphatically demonstrated the other night at the Cleveland Airport. At least a hundred people were impatiently awaiting the arrival of the night mail plane from Chicago at twelve o'clock. All of which goes to show, that, should proper advertising and publicity be given, aviation would become a byword in Cleveland homes The new airport is a great drawing card to Clevelanders and is becoming actual competition to the many amusement places Pains are taken there to give the layman a comprehensive view on the intricacies of flying You find less and less people asking whether "you could get down to the ground if your engine stopped". And, praised be, the "I'd-fly-if-I-could-keep-one-foot-on-the-ground-" species are fast disappearing

Spring weather has been heralded by many divers events The doffing of the winter flying togs by the Air Mail pilots is significant (although Lloyd Bertaud came in last week, on one of the most Springlike days in his "Sweat bath" as he so aptly termed it) An occasional Standard or Jenny puts in its appearance and the barnstormers have a langourous look in their eyes which betokens the annual re-painting of their stored air mounts John Paul Riddle of the Embry Riddle company, flew up from Cincinnati the other day in a new Hisso-Waco and gave the jaded winter flying appetites at the field a few springtime thrills with its performance It looks as though the Ford hangar, now under construction, will not be available for occupancy for some time, as labor troubles do not seem to be limited to London alone, so Henry's Stouts will have to remain in the "Great open spaces" for the time being. Casey Jones, recently, came through from Buffalo, N Y, in a Carrier Pigeon, enroute for Kansas City, Mo, and recently, Eddie Stinson brought his Stinson-Detroiter here for a short visit

Along with the Whitbeck Gas-stretcher and the multiple zoomer, a local inventor, Marvin T Mokah, of East Wallop, Ohio, has startled the aeronautical world with his perfection of a device which renders it impossible to stall your engine He has worked on this idea for the past eight years, and, according to latest reports, has at last finished it It may be fitted on any plane from a Dormoy to a Barling, though none, as yet, have been sold. One phase, however, was grossly neglected by Mokah The idea of non-stalling is, indeed, excellent, but alas—complications have arisen, the said complication being the absolute impossibility of stopping the motor Mr Mokah used a Gnome rotary in his tests and for the last week, has summoned all his inventive genius to the fore for the express purpose of making the non-stall engine stall There is no gas in it, and needs none, thanks to the gas-stretcher He has caved in the cylinder walls with an ax, has taken off the magneto, and even turned the fire hose on it to no avail, it continues to run with abandon. As a last resort, Mokah removed the devise, and reports that the engine still merrily revolves He will welcome any suggestions as to how to make the darn thing stop running and is seriously thinking of inventing a stalling device for the non-stall engine. It is all very well to have a non-stall engine, and, should the opinion of the writer be asked, which it won't, it is carrying things a bit far not to be able to stop. This trouble has my whole hearted interest and I am anxious to see just what the outcome of this modern Frankenstein may be Further developments of the Mokah Non-stall engine will appear in a later issue, as the future of aviation depends on the success of making this motor's functionings cease.

Start of N.A.T.

The National Air Transport, Inc., on May 12 began air mail service between Dallas and Chicago, bringing the cities within twelve hours of each other by mail

The new service also knocks about thirty-four hours off the rail mail schedule between Dallas and New York, as connections were made with the East and West night air mail at Chicago

So heavy was the first day traffic that two planes instead of the one scheduled were necessary to carry both north and south bound mail over the route which put Dallas, Fort Worth, Oklahoma City, Wichita, Kansas City, St Joseph, Moline and points adjacent within overnight postal communication with the East

The first southbound plane, bearing 169 lb of mail, left the municipal air field here at 6 05 a.m The second, bearing 276½ lb., of which more than half was from New York, took off at 6 54 a m

At Moline, the first stop, the first plane arrived at 7 30 a m and the second at 8 15 a m., to be greeted by 1,000 persons and 10,000 letters The southbound planes, traveling ahead of schedule, reached St Joseph soon after 10 o'clock and from there made Kansas City at 10 55 a. m and 11 16 a m., where these planes completed their part of the journey, and after welcoming ceremonies, turned their cargo over to two other southbound planes, which left a few minutes later

The first southbound plane to take off reached Oklahoma City soon after 3 p.m and hopped off ten minutes later for points in Texas and the end of its maiden trip

The northbound planes were delayed forty-five minutes at Dallas because of the inauguration ceremonies, and bucked headwinds all the way to Kansas City, reaching Wichita an hour behind schedule and arriving at the Kansas City field also an hour late

Here two other planes took over their cargo and departed for Chicago, one of them expecting to stop at St Joseph, Mo., and the other scheduled through to Chicago

United States Air Forces

Majors Saved By Chutes

An airplane collision in midair, 3,000 ft. above the ground, complete demolition of both planes, followed by a perfect landing in parachutes by the two aviators, has been reported from Langley Field, Va., to the War Department. The collision occurred at 2 p.m on May 10, the officers whose equipment and presence of mind saved their lives being Maj Harold E. Greiger, and Maj. Horace H. Hickam. The official report received by the Chief of the Air Service and made public by the War Department on May 10, follows:

"Langley Field, Va., 2 56 p m Two S E 5 airplanes engaged in problem of pursuit attack on bombardment aviation collided at this station in the air about 2 p.m., at approximately 3,000 ft. altitude, and were totally wrecked The pilots, Majs Harold E Greiger, A.S., and Horace M Hickam, A.S., escaped through the use of the parachute, neither suffering serious injury."

Naval Air Training Regulations

Aviation classes for officers and men at the Naval Air Station will be doubled by a new order issued by the Bureau of Navigation on May 4. The classes will be assembled in February, May, August, and November, instead of semi-annually Three of the classes will be for officers and one for enlisted personnel. In addition to the regular number of student aviators under training at Pensacola, about 48 officers of the rank of Lieutenant-Commander and above who graduated from the Naval Academy prior to 1913 will be sent through the training course This is expected to produce about thirty-two qualified naval aviators of senior rank. The first class of eight of these officers will be assembled at Pensacola by Aug 15, 1926, and, every three months thereafter, eight more officers of these ranks will join the school

The training course will be continued at six months which will make the classes overlap There will be constant training in this way, in ground work, radio and actual flight training in land planes and seaplanes

For Naval Academy classes subsequent to 1912, applicants for aviation duty will still be required to meet the age limit of thirty-one years and to have not less than two years sea duty prior to their assignment to aviation duty The classes which graduated last June and the class graduating in June 1926 from the Naval Academy have been made exceptions to this rule and will be available for aviation training in November 1926 and August 1927 respectively Assignment to aviation duty will normally be for a period of at least five years.

In addition to the above officers, the regular classes numbering about eighty officers will be maintained at Pensacola, and twenty-five ensigns will be under training at all times at the Naval Air Station, Hampton Roads, Va., and twenty-five more at the Naval Air Station, San Diego, Calif.

As a result of these last orders, arrangements are now completed for the training of officers of all ranks from Rear Admiral to ensign and qualifying them as either aviation pilots or aviation observers

Navy Seaplanes Loaned for Coast Patrol

Secretary Wilbur of the Navy has granted the request of the Treasury for the transfer of four seaplanes to be used by the Coast Guard, prohibition and customs forces in coast patrol work.

Announcement of the action was made May 3, by Assistant Secretary Andrews, the Treasury's enforcement chief, who said the planes would be turned over immediately to M. O Dunning, Collector of Customs at Savannah, Ga., and supervisor of prohibition and smuggling enforcement in North and South Carolina, Georgia and Florida

Mr Andrews said he anticipated chief need of the planes would be around the lower coast of Florida.

With the delivery of the navy planes, the Coast Guard now has five machines in which to scout law violators, and Congress has granted an appropriation for the purchase of six others

Hawaiian Airways

The Hawaiian Islands will be covered with a network of military airways, as a direct result of the information of Hawaiian defense needs shown by the combined Army and Navy maneuvers of the summer of 1925, it was announced on April 28 by the War Department

The plans for the creation of airways in Hawaii is explained in the following terms, by the War Department:

"This action is the result of a study of the defenses of Oahu, Hawaiian Islands, following the joint Army and Navy exercise No 3, which took place last May. It was shown that an adequate defense of Oahu requires the establishment of advanced air bases on the outlying islands in the Hawaiian group."

The War Department has been arranging for flying fields and landing places, through an exchange of lands with the Territory of Hawaii, as authorized by Congress in such situation The sites of the fields are near Wailan on Kauai Island, near Lanai City on Lanai Island; Upolu Point on Hawaii Island, South Cape on Hawaii Island, and near Hanapepe on Kauai Island

Lieut James H Doolittle will succeed Lieut. John A. Macready as chief of the Flight Test Section at McCook Field, Dayton, Ohio, it is announced

Flight Training for Naval Graduates

A new general order was signed by the Secretary of the Navy, Curtis D. Wilbur, which provides for flight training for the graduates of the Naval Academy It requires all graduates of the Academy to take a course of training of

25 flight hours either at Naval Air Station, Hampton Roads, Va., or at Naval Air Station, San Diego, Calif.

The general order provides: "Commencing with the Naval Academy class of 1926 all graduates of the Naval Academy upon going afloat will be given a course of 25 flight hours about as follows:

	Hours
Dual	11
Bombing	3
Photography	1
Gunnery	3
Radio	2
Spotting	1
Navigation	4

Changes in the above course may be effected by commanding officers, Naval Air Station, Hampton Roads, Va., and San Diego, Calif. The Bureau of Navigation will be kept informed of such changes.

"For graduates attached to the Scouting Fleet, the instruction will be given at the Naval Air Station, Hampton Roads, Va., and for graduates attached to the Battle Fleet, at the Naval Air Station, San Diego, Calif. For the purpose of giving this instruction, flight schools will be established at these air stations and the commanding officers of these stations will be responsible for the instruction.

"The commanding officers of the Naval Air Stations at San Diego and Hampton Roads will arrange for details of graduates to the schools with the Commander-in-Chief, U.S. Fleet, in order that the schools may, so far as practicable, be operated at a constant output. The schools should be operated in such a manner that each Naval Academy class will have completed its instruction during its first year of sea duty. However, graduates will be considered available up to two years after graduation.

"The mission of these schools will be to make officers familiar with aviation activities by actual experience in the air and at the same time to ascertain those most suitable for further training at Pensacola as naval aviators. Records of performance as required by the Department will be kept.

"Graduates who show marked aptitude, and who desire, may be given from two to five solo hours after the completion of ten hours dual and the course modified accordingly.

"Such practical ground instruction as is necessary shall be given by the commanding officers of the air stations. Curricula covering ground and flight training when prepared shall be forwarded to the Department for approval.

"Officers other than recent graduates may be assigned to those classes when their services can be spared. A suitable entry will be made on their records.

"The Bureaus of Navigation and Aeronautics shall be charged with the procurement of personnel and material respectively to effect the prescribed training. Funds for maintenance and operation will be provided from the appropriation 'Aviation, Navy'."

Commended By Navy Secretary

Two naval aviators and an enlisted man have been commended by the Secretary of the Navy, it was announced, April 22, for their work in locating an open boat adrift at sea in a storm, with three men aboard, in Pearl Harbor, Hawaii, in August, 1925.

The text of the official report received at the Navy Department continues:

The aviators took off in the dark, in an unusually high wind, with storm sea running, after a call for assistance in locating the boat was received at the air station. Great anxiety for the safety of the men in the boat was felt, as they had been missing twelve hours.

The stand-by pilot, Lieut. William Sinton, U.S.N., and Lieut. T. G. Fisher were sent to search for the boat. Aviation Machinist's Mate Herbert Reynolds volunteered to go with them as observer, though warned it was a perilous undertaking.

By flying very close to the waves, the boat was located drifting southwest off Barger's point. The plane returned to the station with the news of the boat and a tug was sent to its rescue. The boat was picked up and the men saved.

Naval Fliers Find Lost Motor Boat

Two naval aviators and an enlisted man, who were on duty at the Naval Air Station, Pearl Harbor, have been commended for their work in assisting to locate an open motor boat adrift at sea with three men on board.

The aviators took off in the dark, in an unusually high wind, with storm sea running, after a call for assistance in locating the boat was received at the air station, as great anxiety for the safety of the men in the boat was felt. They had been missing twelve hours.

The stand-by pilot, Lieut. William Sinton, U.S.N. and Lieut. T. G. Fisher were sent to search for the boat. Aviation Machinist's Mate, Herbert Reynolds volunteered to go with them as observer though warned it was a perilous undertaking.

By flying very close to the waves, the boat was located drifting Southwest off Harbor's Point. The plane returned to the station with the news of the boat and a tug was sent to its rescue. The boat was picked up and the men saved.

Will Join Pacific Fleet

When the aircraft carrier, Langley, is relieved by the Saratoga as flagship of the Battle Fleet Air Squadrons, she and the aircraft tender Aroostook will form an aircraft squadron with the fleet base force (Pacific).

The Wright, now flagship of the Aircraft Squadrons, Scouting Fleet, will, when relieved by the Lexington, go to the Asiatic Station and there relieve the Jason as tender for the Aircraft Squadrons of the Asiatic Fleet. The Jason will then return and join the Fleet Base Force as an aircraft tender.

With the above forces there will be a total of twenty-one squadrons of airplanes consisting of fighting, torpedo and bombing, scouting and observation planes. Of these squadrons, five will be assigned to each of the large carriers, Lexington and Saratoga. The Battleship Divisions of the Battle Fleet will be assigned three squadrons of observation and fighting planes. The Battleship Divisions of the Scouting Fleet will have two squadrons of the same type of planes.

Scouting Squadrons

The destroyers with the Battle Fleet will have with them one squadron of observation planes. In addition there will be on the west coast, three scouting squadrons with the Fleet Base Force and some experimental planes on the Langley.

With the Atlantic forces, afloat, in addition to the planes on the Lexington, there will be one squadron of observation planes with the Light Cruiser Divisions. All of the light cruisers carry two planes and are equipped with catapults for launching them. The rigid airship Los Angeles will continue her observations from Lakehurst.

Two squadrons of torpedo and bombing planes will be with the Wright on the Asiatic Station.

Navy Board of Selection

The Secretary of the Navy has ordered a Board on Selection to recommend officers of the Line for promotion to the grades of rear admiral, captain, and commander, to be convened at the Navy Department on June 7, 1926.

Admiral Samuel S. Robinson, U.S.N., commander-in-chief of the United States Fleet, has been named as president of the board. Other members of the board will be:

Rear Admiral Thomas Washington, U.S.N.
Rear Admiral Ashley H. Robertson, U.S.N.
Rear Admiral Henry A. Wiley, U.S.N.
Rear Admiral Thomas P. Magruder, U.S.N.
Rear Admiral William C. Cole, U.S.N.
Rear Admiral Montgomery M. Taylor, U.S.N.
Rear Admiral Charles B. McVay, U.S.N.
Rear Admiral William A. Moffett, U.S.N.
Commander Randall Jacobs, U.S.N., recorder.

The Board will have before it as eligible for selection, officers as follows:

153 captains, 290 commanders and 526 lieutenant commanders. Of this number, approximately four admirals, 30 captains and 45 commanders will be selected from among those whose names will be presented to the Selection Board.

Lighthouses as Airway Markers

Equipping lighthouses to serve as guides to aviators as well as to mariners is the newest departure in plans projected by governmental agencies to utilize existing navigation aids for the benefit of aviation, according to the Lighthouse Service of the Department of Commerce, which announced May 1 that it was cooperating with the Hydrographic Office of the Navy Department in experiments designed to make lighthouses serve as direction finders for fliers.

The plans now call for the painting of airway marks, which will be easily distinguished by aviators, on roofs of lighthouses along certain defined airways in Chesapeake Bay and tributaries in the Fifth Lighthouse District. The marks are letters and rings of contrasting colors, with large white arrows pointing true north. If the plan succeeds for daylight flying, it may be extended to night flying by the installation of beacon lights pointing upward.

Army Air Orders

Following officers, A S, received from present assignment at stations indicated, and will proceed to San Francisco, sailing on transport Sept. 30 for the Hawaiian Dept.: First Lieuts. Bernard T. Caster, San Diego, James C. Shively, Kelly Field, Russell L. Williamson, Fort Sam Houston, Second Lieuts. John M. Weikert, Kelly Field, Carl B. McDaniel, Brooks Field, Clarence S. Thorpe, Brooks Field, Norma D. Frost, Brooks Field.

First Lieuts. Carl W. Pyle, A S, Wright Field and Carlyle H. Ridenour, A S., McCook Field, to New York City, sailing Sept. 8 via Government transportation to Hawaiian Dept.

Capt. Lloyd L. Harvey and First Lieut. Langhorne W. Motley, A S, Langley Field, to New York City, sailing Sept. 8 via Government transportation to Hawaiian Dept.

First Lieut. Fred S. Borum, A.S., Buffalo, to New York City, sailing Sept. 8 via Government transportation to Hawaiian Dept.

First Lieuts. Samuel C. Skemp, A S., Bolling Field and George C. McDonald, A S., Langley Field, to New York City, sailing Sept. 2 for Canal Zone.

First Lieut. Lawrence J. Carr, A S., Kelly Field, to San Francisco, sailing Aug. 20 for Philippine Islands.

First Lieut. Corley P. McDarment, A S., Washington, to New York City, sailing Oct. 6 for Philippine Islands.

First Lieut. David G. Langle, A S., McCook Field, to New York City, sailing July 28 for Philippine Islands.

First Lieut. Edward W. Kelley, A S. (Inf.), Brooks Field, to Fort Sam Houston.

First Lieut. Raymond C. Zettel A S., Kelly Field to McCook Field.

First Lieut. James B. Carroll, A S., Kelly Field and Cambridge, to Washington, for duty in office of Ch. of A S.

First Lieut. John De F. Barker, A S., Philips Field, to Washington, for duty in office of Ch. of A S.

Navy Air Orders

Lieut. Andrew C. McFall det. Staff Aircraft Sqdns., Sctg. Flt., to Naval Acad.

Ens. William L. Hoffhems det. Nav. A. Sta., Pensacola, to temp. duty U S S. Chewink.

Lieut. Comdr. Wadleigh Capelart det. Nav. A. Sta., San Diego, to duty with Aref. Sqdns., Battle Flt.

Lieut. John G. Farrell det. Rec. Ship, Puget Sound, to Nav. A. Sta., Pensacola.

Lieut. (jg) Russell H. Sullivan det. Aref. Sqdns., Battle Flt. to temp. duty 11th Nav. Dist., San Diego.

Lieut. (jg) William B. Jackson det. Nav. A. Sta., Pensacola, to U S S. Sharkey.

Marine Corps Air Orders

Sec. Lieut. L. T. Burke det. M. B., N A S., Pensacola, to 1st Brigade, Haiti.

Sec. Lieut. J. E. Jones det. M B, N A S., Pensacola, to 1st Brigade, Haiti.

PUBLISHER'S NEWS LETTER

The one clearly defined fact that was demonstrated by a short visit to the airdromes of Europe is, that writing, flying and visiting aircraft factories, not to mention the delightful hospitality, do not mingle successfully. For instance, this letter is being written on one of the Dutch K L. M. Fokker F VII planes on a flight from Copenhagen, Denmark, to Amsterdam, Holland The precise location is between Hamburg and Bremen Yesterday, we lunched in Berlin and dined in Copenhagen, though a twelve-hour trip by train This morning,—breakfast in Copenhagen, lunch in Hamburg, tea or schnapps in Amsterdam and dinner in London with Charles Grey of *The Aeroplane*, and, after some sleep and a light breakfast, we will have lunch in Rotterdam, dine in Berlin, and this schedule is not more active than others that have been carried out. But, to try to give impressions of English, French, Dutch, German, Belgian and Danish aviation, after a fly past, is too dangerous a task for even the writer of this page

* * * *

Practically all the eastern air lines have been covered,—London-Paris by Imperial Airways, Paris-London in a Farman Goliath of the Air Union; London-Cologne in a twin-engine Handley Page of the Imperial Airways Amsterdam-Paris in another Goliath of the French line, Paris-Amsterdam in the big three-engine Koolhoven of the K L M., Amsterdam-Berlin and Berlin-Copenhagen in three-engine Junkers Luft Hansa planes, and all this in about two weeks of flying Even to try to put together the notes would take several days and as there will be more time later, that cannot be spent so profitably, the description of the airways of Europe and impressions of the aviation situation will come as soon as a day or two without a long air ride will permit.

The exceptional opportunity that has been afforded to the writer by practically all the air lines of Europe to travel over their routes is most sincerely appreciated. To be able to criss-cross the map and see the country from the air is a rare privilege which, it is hoped, can be utilized for the benefit of the readers of AVIATION.

Incidentally, it might be recorded that we have flown during the intermittent writing of this page into Holland The distractions of the interesting countryside make even writing the simplest message difficult.

One fortunate circumstance has made the possibilities of air travel very much greater than ever before. On April 19, German Luft Hansa air lines commenced operating For several months there has been no flying in Germany. In fact, we made the second trip from Amsterdam to Berlin When "we" is said, it is not the editorial "we", but the very cheerful wife of the writer who has not traveled in a train since arriving in London, and she is now in Berlin awaiting the flight to Switzerland and over the Alps

With the opportunity of flying into Russia and to Morocco, as well as from Constantinople to Paris, there can be little blame attached to the failure to see and record at the same time.

* * * *

In just a word or two the aviation situation here can be summarized Aviation is taken seriously in Europe. Both the military and civil sides are receiving much greater thought and emphasis than in the United States So far as commercial aviation is concerned, aside from air transport operations, its absence is very noticeable. There are, however, some companies that appear to be making a good profit, the details of which must come later.

As we are now flying over the Zuider Zee and nearing Amsterdam where planes must be changed for London, this apology for the lack of more news must be concluded.—L.D.G

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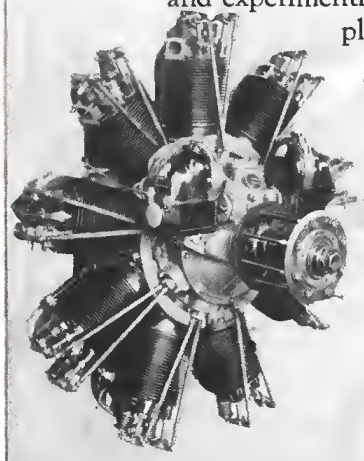

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